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Mila Gascó-Hernández *Editor*

Open Government

Opportunities and Challenges for
Public Governance

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*This book is dedicated to Marcos and Hawa,
my incredible children, and to Carlos, my
partner in life.*

Preface

On January 2009, President Obama signed the Memorandum on Transparency and Open Government. The memorandum declared the new Administration's commitment to creating an unprecedented level of openness in government and establishing a system linking three principles: transparency, public participation and collaboration.

Since then, not only federal agencies in the United States but, also, public administrations around the world have embarked on open government initiatives and have worked to redefine their relationship with citizens and with each other. What's more, on September 20th, 2011, eight governments gathered in New York to launch the Open Government Partnership, a new multilateral initiative to promote open government.

The benefits attributed to open government are many and by no means universally shared. They include the claims that open government leads to more effective decision making and services, safeguards against corruption, enables public scrutiny, and promotes citizens' trust in government. Actually, there is compelling evidence that properly implemented and enforced open government frameworks can support a number of benefits for governments and societies.

In the academic literature, openness has been approached from two different perspectives: (Meijer et al. 2012): transparency and participation. The literature on transparency revolves around terms such as freedom of information, Internet, active dissemination of information, access to documents and usability of websites (Curtin and Mendes 2011). The core question tackled by these works is: what is being made visible/transparent? Literature discusses, among other issues, the nature and scope of transparency, the usefulness of information, and the timing of the release of documents. The premise underlying these studies is that transparency yields to accountability. At the same time, a more accountable government is a more legitimate one (Sandóval-Almazán 2011). Finally, legitimacy strengthens public trust in the government (Hood 2011; Hazell and Worthy 2010; Jaeger and Bertot 2010).

The literature on participation has aimed at answering the following question: whose voice is heard? Both theoretical and empirical studies have focused on the interactive design of public policies, the processes of public consultation, or the

involvement of stakeholders. Many of those works have attempted to assess differences and inequalities in terms of citizen participation (Meijer et al. 2012).

Although, the links between transparency and participation may be evident, this relationship has hardly been explored by the academic literature. Only very recently, and under the open government framework, some authors have started to work on it. Noveck (2009) is one of them. She refers to this interaction and connects access to information to new ways of citizen participation. She also suggests that technology will play a key role in overcoming those barriers that hinder transparency and participation.

In the real world, however, the speed of events and the “need” to implement open government projects not to be left behind have given rise to confusion and ambiguity. Although, many of the initiatives have been based on opening data and on promoting open action, generally, speaking, governments have followed different directions and interpretations when it has come to implement them. As a result, nowadays, it can be said that the development of open government is unequal and heterogeneous. There is confusion about the concept itself (what an open government initiative is and what is not, difference with the e-government term, newness of the term...), about its implementation process and about its real impact.

Given this global context, and taking into account both the need of academicians and practitioners, it is the intention of this book to shed light on the open government concept and, in particular:

- To provide comprehensive knowledge of recent major developments of open government around the world.
- To analyze the importance of open government efforts for public governance.
- To provide insightful analysis about those factors that are critical when designing, implementing and evaluating open government initiatives.
- To discuss how contextual factors affect open government initiatives’ success or failure.
- To explore the existence of theoretical models of open government.
- To propose strategies to move forward and to address future challenges in an international context.

This collective work is structured in 13 chapters. **Esteve Sanz** opens the book with an interesting reflection. His chapter investigates how the cultural structure of the Internet interacts with rationalistic bureaucratic cultures through the open government discourse, that is, what the interaction between the Internet culture (the culture of openness) and the bureaucratic culture of secrecy is. In order to do so, after a theoretical and conceptual discussion around the meaning of Internet culture, the chapter uses the case study of the open government policy of the Obama administration to explore how the cultural code openness/closeness is penetrating the core of the bureaucratic culture (*Open Government and Their Cultural Transitions*).

Four more chapters present and assess open government strategies in other parts of the world. It is the case of the work of **Pablo Sanabria, Cristian Pliscoff and Ricardo Gomes**. The authors review the situation of three South American countries (Colombia, Chile and Brazil), with different economies, populations and insti-

tutions, which have recently undertook a particular set of open government practices with the common goal of increasing transparency, citizen participation and, eventually, government legitimacy (*e-Government Practices in South American Countries: Echoing a Global Trend or Really Improving Governance? The Experiences of Colombia, Chile and Brazil*).

Evika Karamagioli, Eleni-Revekka Staïou, and Dimitris Gouscos's chapter also assesses a national strategy: OpenGov.gr. This Greek initiative was designed to serve the principles of transparency, deliberation, collaboration and accountability and includes two basic initiatives: open calls for the recruitment of public administration officials and electronic deliberation for participatory rule making. The authors describe and analyze it as a top-down e-participation effort (*Can Open Government Models Contribute to More Collaborative Ways of Governance?—An Assessment of the Greek OpenGov Initiative*).

Mentxu Ramilo, Iñaki Ortiz, Alberto Ortiz de Zárate and Venan Llonan present the worldwide-recognized successful case of the Basque Country, one of the 17 Spanish Autonomous Communities. Their assessment takes into account three different perspectives: (1) an analytical perspective aimed at understanding the political and organizational implications involved in the open government policy, (2) a practical perspective, given by two of the authors, who took part in the implementation of the project, and (3) a citizen perspective, needed to judge their real involvement (*Open Government in the Basque Country*).

Finally, **Benedetta Trivellato, Roberto Boselli and Dario Cavenago** provide a picture of some issues that should be considered during the design and implementation of open government initiatives, based on the analysis of four Italian case studies at the sub-national level in the northern regions of Lombardy and Piedmont. The aim of these case studies' description and analysis is to provide a comprehensive picture of their objectives and of the tools which were employed to pursue them, as well as of the difficulties encountered (*Design and Implementation of Open Government Initiatives at the Sub-National Level: Lessons from Italian Cases*).

Although, the idea of openness in public administrations and organizations is not new, the current spreading use of information systems and technological advances in modern societies has attained new information demands and claims (Sandóval-Almazán 2011). In particular, social media is used as public information tools. It radically reduces the cost of information diffusion and makes sharing with the citizenry feasible and useful (Lee and Kwak 2012; Harrison et al. 2012). Also, the publication of information in standard, open and interoperable formats increases its use and re-use (De La Fuente 2011; Coroján and Campos 2011).

Several chapters have referred to these two important tools: social media and open data. In their chapter, **Karan Riarh and Jeffrey Roy** examine social media trends and usage at the local level in the Canadian province of Nova Scotia. They are particularly interested in how social media is purported to be a driver of citizen engagement and participative capacities. Thus, their discussion contributes to shed light on the so-called participation dimension of open government (*The Impact of Social Media on Government and Democracy: An Examination of Municipal Usage in Nova, Scotia, Canada*).

More chapters have focused on open data, which reflects what is happening on the field: governments are implementing more open data than social media initiatives. Despite the number of contributions focusing on this topic, chapters' approaches differ, not only from a conceptual perspective but, also, from an empirical one. The first one, **Albert Meijer, Josta de Hoog, Mark van Twist, Martijn van der Steen and Jorren Scherpenisse's** chapter, starts challenging existing impact assessments of open data. They argue that whether open data delivers its promise depends on specific, local interactions that can be managed and controlled to a limited extent. They use two cases (open data in public transportation and in policing in The Netherlands) to show the use of their perspective (*Understanding the Dynamics of Open Data. From Sweeping Statements to Complex Contextual Interactions*).

Anneke Zuiderwijk and Marijn Janssen complement the previous views and conduct a comprehensive review of open data barriers. Their work shows that many barriers can be identified with regard to data creation, publication, finding, analyzing, processing, discussion and providing feedback (*Barriers and Development Directions for the Publication and Usage of Open Data: A Socio-Technical View*).

In their chapter, **Isabell Egger-Peitler and Tobias Polzer** wonder whether and to what extent developments at European level and other factors have an effect on local efforts towards open data. They take the example of the city of Vienna, in Austria, finding a decoupling of supranational strategies and national implementation activities (*Open Data: European Ambitions and Local Efforts. Experiences from Austria*).

The last two works on open data go further and bring new concepts in. On one hand, the chapter by **Glenn Vancauwenberghe, Ezra Dessers, Joep Cromptvoets and Danny Vandenbroucke** explores in the region of Flanders (Belgium) whether coordination in the context of spatial data infrastructure (SDI) contributes to the degree of spatial data sharing. Their ultimate goal is to assess the potential contribution of SDI to the open data process (*Realizing Data Sharing: The Role of Spatial Data Infrastructures*).

On the other hand, **Gianluca Misuraca, Francesco Mureddu and David Osimo** provide an analysis based on a meta review and selected results of analysis of case studies to identify the characteristics and benefits resulting from applications of open and big data techniques and methodologies within the context of ICT solutions for collaborative governance and policy modelling (*Policy Making 2.0: Unleashing the Power of Big Data for Public Governance*).

The book ends with two interesting chapters which connect the concept of open government to other notions, proposing ideas to move forward in a creative and innovative way. The first of them, by **Jörn von Lucke and Katharina Große**, introduces the idea of open collaboration and presents strategies which go beyond participation of citizens or other stakeholders in the decision/preparation phase of the policy making process. Thus, the authors analyze the potential of opening up the latter stages of such process: implementation, monitoring and evaluation (*Open Government Collaboration: Opportunities and Challenges of Open Collaborating with and Within Government*).

Finally, **Marc Garriga and Júlia López** reflect upon the links of open government and smart cities, particularly when it comes to citizen empowerment and involvement in urban management decisions and in the delivery of public services. They also show that open government initiatives are needed in order for a smart city strategy to be successful (*The Role of Open Government in Smart Cities*).

In sum, the book presents a collection of chapters that is not comprehensive but that tackles different issues related to open government that may be of interest for both researchers and practitioners. It shows the state of open government in some parts of the world, at different administrative levels, and it draws insightful ideas regarding its implementation, but it also presents some interesting conceptual perspectives on transparency, participation and collaboration and on the use of social media and open data in achieving them. More could be said about open government. *Open Government. Opportunities and Challenges for Public Governance* is only a first approach to the field. I hope that the authors' contributions encourage the reader to keep strengthening the study and practice of open government around the world.

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Open Governments and Their Cultural Transitions

Esteve Sanz

1 Introduction: Theoretical Framework

The hypotheses presented in this chapter develop in continuity with those sociological theories that argue that we stand at the opening of a post-bureaucratic era (Lyon 1988; Giddens 1990; Beck 1992; Held et al. 1999; Castells 2009; Sennett 2006). The characteristic outlook of these schools concentrates mainly upon the broad institutional transformations associated to the advent of electronic-based communication networks, especially the Internet. We are moving, it is often argued, towards a diversity of information societies, where public and private bureaucracies are transitioning towards more horizontal and efficient organizational forms. This chapter investigates the cultural role that open government policies are playing in these transitions.

The central theoretical premises of this chapter can be stated quite simply. The social/organizational impact of a given technology is not only determined by its instrumental possibilities or the values and beliefs of its users and material producers but also deeply influenced by the symbolic codes that are necessarily embedded in any technological system. These codes are binary codes injected through plausible yet fantastic narratives about the potentialities of the technology. For the most part, the influence of this cultural codification remains invisible, but it shapes a shared technological consciousness: the interiorization of a set of irrational expectations and moral assumptions that predisposes the uses and modifications of a given technology. Technology is culturally codified at the early stages of its production/adoption, when the emotional effervescence around its novelty combines with the systemic lack of evidence about its projected impact. Nevertheless, this codification is never fully completed: it is more a process than a fixed outcome, more of an emerging culture structure than a fixed meaning. There is power involved in the process: Codifiers need access to the means of symbolic production to intervene in

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this continually emerging meaning. But once certain binary codes acquire stability, the cultural structure of a given technology marks its surrounding discourses and counter-discourses, which in turn inspire how these technologies are appropriated by a society.

The cultural codification of technology proceeds through the mobilization of “sacred” and “profane” associations, a classic argument of the late-Durkhemian school of sociological research (Alexander 2005, 2008a; Smith 1998). The sacred provides a particular image of the good connected to the utopian narrative about the technology. The successful incorporation of a particular technology in a given social system implies the existence of ritual encounters with this more or less encoded sacred good: What drives the use of technology is not only utilitarian reason, but also the subjective impulse to experience a symbolic connection with the community. At the same time, the emotional charge of the sacred is always reinforced by a dystopian image of the profane, the anti-community evil from which human beings must be saved. It is at the very beginning of an invention when the transcendental tone of the technological discourse is more explicit. For example, Jeffrey C. Alexander (2005) analyzed the rhetorical fantasies of salvation and damnation that filled the early discourses about the computer.

Religious signifiers are often used to program the technology with its binary cultural structure, but once the apocalyptic and salvation limits have been set, technology never settles into the mundane world of pure rationality. More subtle secular concepts, including socio-scientific jargon, structure similar sacred and profane associations, but its discursive connections with the transcendental narratives remain implicit and unexplained. In this sense, decoding a technological system from a cultural-sociological point of view also means bringing into light these connections: make them visible, so that the unavoidable myths that penetrate technology remain under more reflexive control.

This chapter investigates how the cultural structure of the Internet interacts with rationalistic bureaucratic cultures through the open government discourse. This aims to be a distinctive approach to the study of information society, one that captures the cultural discontinuities that come with it. The Internet is the crucial tool of the information society, but it is also its symbol: a powerful, malleable totem that, nonetheless, carries with it a particular cultural structure, the Internet culture (Porter 1997; Jenkins 2006), that impacts in a similar vein every province it touches. This mirrors the role played by bureaucracy for the modern, industrial society. The early overlaps between the Internet and the military bureaucracy (the support and style of management of the US Department of Defense was crucial for the development of the Internet) seemed to indicate a smooth cultural coupling between the two. The Internet was to be a new chapter of the industrialization of war. Deeply influenced by symbolic significance of “national security” concerns, it would have simply reinforced the quintessential modern apocalyptic narrative from which the bureaucratic notions of “expertise” and “official secret” are borne out. The coding of “piracy as the end of culture” would have been firmly inscribed in the technology: a “good” Internet would have been a bureaucratically ordered Internet.

And it still can be. However, the Internet culture was initially programed in different codes that did not synchronize well with modern bureaucratic cultures, thus creating multiple transitional tensions that are still being negotiated (Castells and Ollé Sanz 2004). The term “openness,” which appears not only in the very notion of open government but also in current political and academic discourses and technical language around the Internet, offers, this chapter argues, a very interesting yet unexplored entry point to capture the fundamental features of the cultural structure of the Internet.

At its simplest, “openness” has come to symbolize the central “democratic” aspects of the Internet: the sacred utopian discourse that embodies the mythical aspirations to achieve “freedom” and “shared humanity” through electronic means. In this sense, coding the Internet as an “open” technology is a predictable discursive practice in a democratic context: one that “wishes” to see and incorporate its materiality as a tool for trusting and straightforward social relations, transparent governments, inclusive institutions, and fair economies. To protect the sacred symbol of openness, the agents that threaten the Internet with “closeness” and “secrecy” need to be isolated, and public quasi-rituals need to be established to “purify” the Internet from all those practices that bring it closer to its dystopian narrative: one that sees it as an instrument of global surveillance and personal alienation.

Yet the Internet’s “openness” offers also a more complex reading, for it is, when properly uncovered, an item of secular “faith” arbitrarily imposed into the emerging meaning of the invention. As an “open” technology, the Internet achieves a particular symbolic status that clashes in a fundamental way with key aspects of the culture of private and public governments in a process that cannot be simply understood as the regeneration of a Habermasian “public sphere.” It implies, as we will argue below, the gradual emergence of a systemic cultural pressure to “open up” to creativity and individual autonomy what Max Weber theorized as the rationalistic and secretive “machine.” Once we set our approach in motion, we will present a case study that illustrates both the structural and the strategic symbolic elements involved in this process. We will conclude by reflecting about the potential exclusionary dynamics of the myth of an open government.

2 Openness

Openness, this chapter argues, is the dominant affective force of the Internet. It supplies meaning to the technology at the level of practical consciousness, thus motivating central (but nonexclusive) patterns of production and use. The use of the term itself and its surrounding language has experienced an exponential increase within the last years, in different discursive adaptations, symbolic strategies aimed at transmitting the idea that organizations are capable of adapting the Internet in a smooth, uncomplicated way. And yet, this transition is far from uncomplicated, for more often than not, the Internet’s openness translates into “free” and “transparent,” two issues that place a question mark against the organizational system of modernity.

The material dimension of the Internet (Pinch 2008) offers a good entry point for our investigation, for it bears an important relation with the symbol of openness. Open source software (sometimes also referred as “free” software) and open hardware architecture are consistently described as the fundamental technological feature of the Internet. Source code is a list of instructions that make the “recipe” for a software package. In the technological sense, the notion of “openness” indicates that this code is openly distributed so that “anyone” can modify it and develop new programs and applications. Most of the key components of the Internet, such as the TCP/IP protocols, GNU/Linux operating systems, server programs like Apache, or a multitude of applications and web browsers, can be redistributed for free, without royalties or licensing fees. This explains why the technological aspects of the Internet are in a constant state of flux, and why its core infrastructure has to a certain extent resisted powerful privatizing dynamics (Zittrain 2008). A variety of historical investigations and cultural theories have been put forward to explain how and why the Internet became technologically open (Levy 1984; Himanen 2001; Thomas 2002; Weber 2004; Castells 2002, 2009). According to these theories, the Internet is the technological output of the values of its key producers, where creativity takes precedence over the protestant ethic generally ascribed to modern organizations.

Yet, these theories fail to capture properly the emerging symbolic character of the Internet, and thus the constellation of cultural practices around the meaning of the technology. Symbols are not the same as shared values. They are strategic, contingent: unlike values, they can be manipulated, reworked, and interchanged by many different types of agents. To understand how the symbol of “openness” inscribed at the root of the Internet culture is diffusing into bureaucratic cultures, we need to dig deeper into the very notion of openness, for the type of ideals that are actually celebrated through it are not immediately apparent.

Some ordinary meanings of the term “open” are already rich in implications for our analytical purposes. When we say that a person has “an open mind” or is “open-minded,” we normally mean that he or she is ready to entertain new ideas beyond utilitarian modes of activity. The individual is ready to leap into the unknown, prepared to embrace novel experiences with an uncertain result: he is called upon to display an attitude of “faith” in the trustworthiness of new input from “the others.” But there is another ordinary usage of the term “open” that bears an even stronger connection with the subjective impulses of the personality. “Being open” or “being an open person” are everyday expressions that normally refer to the willingness or the capacity that a person has of communicating what “she really is.” However, this morality of authenticity includes an implicit expectation about the “negative”: a person is said to be like an “open book” when she expresses not only the information that will render automatic benefits for her, but also the one that has the potential of harming her reputation. “Openness” in this ordinary sense presupposes awareness, tacit, or explicit, of probable negative results. It can incorporate certain calculation, but the attitude of “being open” always involves a significant amount of “hope” or “faith” that the group will read and value and purify the “authenticity” of one’s motives when confessing the “bad” in a more or less ritualistic fashion. The uncertain effect of whatever “negative” information one is disclosing

for external consideration is one of the most intrinsic characteristics of complex secular societies (Thompson 2000). However, this has not annihilated the impulse to seek “absolution” or some sense of holistic connection brought by full external disclosure. It seems just plausible to affirm that the ordinary language of openness (Oxford English Dictionary: accessible or access, exposed without cover, revealed, vulnerable, candid or ingenious, public or in public notice), so intimately connected to the Internet culture, seems to encourage the expression of such sentiment in a secular codified way.

The earliest connections between openness and technology can be traced back to the ideas of the ancient Roman architect and engineer Vitruvius. As the ordinary vocabulary of openness, these connections also evoke a strong subjective component, which is in fact religious in character. In his celebrated treatise *De architectura*, which treats machines, the fabrications of colors for painting, and other technological matters, Vitruvius advocates for a radically open transmission of knowledge and credit to authorship (Long 2001). Vitruvius believed that openness detached the progress of knowledge to the pursuit of wealth or power. For it was a sense of “piety” and honor of past authors, a fundamental doctrine during the revival of traditional Roman religion in the 20s BCE, that should inspire technological innovation.

The secular notion of an “open society” expresses the malleability of the social world and the capacity of human beings to shape the physical and political settings of their existence in a liberal-democratic fashion. Karl Popper articulated the ideal of an open society in liberal rationalistic terms (1945), but it was Henri Bergson who first joined the words in 1934. His approach draws the most explicit links between mysticism, creativity, and openness. “The closed society” Bergson wrote “is that whose members hold together, caring nothing for the rest of humanity, on the alert for attack or defense, bound, in fact, to a perpetual readiness for battle” (Bergson 1935, p. 255). On the contrary, the source of an open society for Bergson is what he calls “creative emotions,” where the causal connection between representation and feeling become fundamentally inversed. Here, the moral structures underlying social cohesion are made of unstable and disorganized “intuitions” that result in representations and actions, and not the other way round. In open, dynamic societies, everyone is somehow an “artist” driven by an imperative demand for creation and expression through different media:

the open society is a society which is deemed in principle to embrace all humanity. A dream dreamt, now and again, by chosen souls, it embodies on every occasion something of itself in creations, each of which, through a more or less far-reaching transformation of man, conquers difficulties hitherto unconquerable.

3 Internet Culture

Unconquerable difficulties will be conquered: civic engagement will be boosted, democracy will be consolidated, productivity will never decrease, information will be free for all. The wish-fulfilling rhetoric of Bergson’s prose is in fact highly remi-

niscence of the most utopian discourses surrounding the early days of the Internet (Lazzarato 2007), a vehicle that was supposed to “transcend” social, geographic, and cultural boundaries (Woolgar 2002; Hand 2008). The influence of Habermas’ arguments are visible in many of the academic interpretations (and necessary empirical corrections) of this well-known discourse: The rationalized communicative action that emerges from the Internet will be free (again) from market-driven imperatives and emotional delusions (Salter 2005). This is, however, an arbitrary translation, for the utopian “transcendental” capacities of the Internet are built into the symbol of “openness,” and this incorporates items of “faith,” “piety,” “confession,” and subjective impulses of creation that are not easily explained through the ideal notion of the rational public sphere. Thus, we propose to investigate the Internet culture through the openness code and its attendant notions. For ease of exposition, we shall set out the elements involved in this exercise as a series of six “decoding” propositions.

1. While rational deliberation assumes a narrowly defined “community” of participants, openness is related to the universalistic notion of “the other” that permeates the Internet culture and structurates the “positive” aspects of the civil sphere (Alexander 2008b). It is more a question of solidarity than rationality. Taken as an ideal value, openness implies no audience discrimination, nor does it imply the sense of compulsory participation that deliberation does. One feels compelled to be open in order to experience a sense of connectedness that transcends particular commitments. Deliberation could follow, but it is not a necessary condition for openness: it is what derives from it. What is indeed a necessary condition is the existence of a symbol of the community that rewards openness, for without this symbolic representation, the sentiment would be confined to immediate contexts of copresence, and thus quite difficult to sustain and consolidate over time. The Internet plays a symbolic role in the notion of “globalization” and the cosmopolitan utopia (Hand and Sandywell 2002). However, it is through the notion of openness that it actually achieves a totemic character: a material expression not of a particular ideology, but of the group.
2. Internet openness means greater circulation of information. Those who have investigated its effects from the Habermasian point of view have focused on sorting out how more information relates to changing levels in political participation, civic engagement, or trust in the economic and political processes. A cultural-sociological approach to information openness would first of all focus on the cultural characteristics of the disclosure. Within the Internet culture, a “confessional” tone, and not the bureaucratic transparency assumed by the Habermasian scholars, seems to be fundamental for this information to be valued as a source of “authentic” openness, thus creating the cultural conditions for idealistic increments in trust and participation. Transparency has a fundamental performative dimension that has gone largely unanalyzed.
3. The sort of transparency embedded in the Internet cultural structure rests upon “faith” in the cultural value of “authentic” openness. In this sense, utopian openness implies lack of mundane calculus: a sort of blind trust in that the disclosure

of whatever information one decides to circulate freely will benefit the community, the organization, or the individual in a largely undefined way. At the same time, a certain element of “hope” is also expected when confronting reciprocity and online feedback. This is consistent with the empirical evidence that Internet users are more supportive of diverse and tolerant points of view than nonusers: One recent study finds that “going online is a way of expressing openness to opposing points of view and new experiences” (Robinson and Steven 2009).

4. Blogs, video blogs, and other participatory platforms are perhaps the most palpable elements of the culture of openness embedded in the Internet: far from being motivated as active contributions to the public sphere, the majority of blogs express creative views and analyses that ultimately develop into dramaturgical acts of self-confession. The investigations of Zizi Papacharissi (2004) into the blogosphere has shown how the coded expression of personal flaws is motivated not by selfish desire, but by the impulse to connect the self to society in a theatrical way: “This particular breed of narcissism” she argues “has a democratizing effect” for it “encourages plurality of voices and expands the public agenda.” This fragmentation and pluralism structured by the Internet culture of openness is much more reminiscent of the ideal of the “open society” as explicated by Bergson than the Habermasian notion of the public sphere.
5. The previous observations already say something about what constitutes the profane in the Internet culture, which is not, as Habermasians implicitly argue, commercialization or nationalization. Closeness in the context of the Internet can be defined as the employment of some sort of technical system or social characteristic as the basis for the exclusionary monopoly of informational resources. Information can be commercialized or can be used for “public” purposes (at least for a while), but it cannot be safely enclosed without risking being polluted and rendered useless. Closed information drains the universalistic totemic character of the Internet, which is at the root of its confessional cultural practices. To commercialize or monitor the Internet are simply mundane practices, to close the Internet is like eating the totemic animal—at your own peril.
6. In sum: There is an important discontinuity here with what Foucault called the “singularly confessing” character of modern society (1978). What the culture structure of the Internet rejects is the existence of a single expert authority that holds the exclusive right to hear and interpret. “Openness” constructs the Internet to play this role, ideally displacing the agency of control from an expert system of whatever sort (economic or political) into a communitarian symbolic token. This does not mean that online communications do not take place within a relationship of power or surveillance; it means that the dominant myth of the Internet depicts it as a purifying, inclusive interlocutor that carries a meaning which goes beyond power and self-interest.

The fusion of the Internet and private and public bureaucracy is governed by the gradual introduction of this cultural structure into key segments of society: The information age is not mainly about technology, information, or knowledge, but about the introduction of the openness code at its organizational center. While de-

tailed and contextualized case studies are necessary to elaborate this theory further, the following section offers a powerful illustration of this trajectory by analyzing, from a late-Durkhemian point of view, one of the most significant contemporary discourses in contemporary government bureaucracies: that of the current US administration. The following exercise only demonstrates how the binary openness/closeness as described above is at the root of the key symbolic discourse of the information society. It does not prove the relevance of “actual” change, but it clearly shows how the Internet is not only a technology, but also an increasingly important cultural logic that articulates the glorification of the new informational democratic “heaven” against the “old” bureaucratic world of secrets, power, and self-interest.

4 Bureaucratic Culture and Internet Culture: The Obama Administration

The meaning of the Internet entered in a liminal crisis after 9/11 which ended up in “transparency” experiments in the public sector, aimed at fusing the culture of openness with the US administrative apparatus. The undergoing story, which is in fact intertwined in complex ways with the succession of events related to Wikileaks and the Snowden case is highly revealing of the complex interaction of the Internet culture and the culture of secrecy in public bureaucracies.

A previous decade of government “openness,” which was driven in part by the rise of the Internet culture, and experienced in trajectory around the globe (Roberts 2006) came to an abrupt end with the dramatic change in perception of the context of governance. A legitimating narrative that questioned the benefits of government transparency was rapidly updated for the circumstances of the new century, (O’Neill 2002; Etzioni 2010) yet, to many observers, the attempt of the Bush administration to reverse openness policies was difficult to justify from a democratic point of view. Max Weber’s famous analysis of the bureaucratic culture of secrecy (1922, pp. 233–234) provided an optimal theoretical background for these commentators:

The pure interest of the bureaucracy in power, however, is efficacious far beyond those areas where purely functional interests make for secrecy. The concept of the ‘official secret’ is the specific invention of bureaucracy, and nothing is so fanatically defended by the bureaucracy as this attitude, which cannot be substantially justified beyond these specifically qualified areas. In facing a parliament, the bureaucracy, out of a sure power instinct, fights every attempt of the parliament to gain knowledge by means of its own experts or from interest groups.

Whether there was more secrecy in the Bush administration than other administrations is a matter which is, by definition, difficult to clarify empirically. However, at the discursive level, the Bush administration clearly identified with the symbol of “national security,” and used a wide array of means of symbolic production to relocate the symbol in the prominent sacred position that it had somehow lost with the advent of globalization. This symbolic strategy included an attempt to re-code the Internet culture along the national security lines. This was not, as Helen

Nissenbaum (2005) convincingly investigated, a mere intensification of the mundane concerns with “technical computer security.” There was a government move, played up by the media, to “securitize” the Internet, to turn it into an iconic object that posed imminent, urgent, and dramatic dangers. Of course, bin Laden was immediately assigned to play the role of villain in the scripted strategy, for as it was insistently pointed out, Al Qaeda used a variety of Internet applications to plan the attacks of September 11. But there were many other antisocial dangers surrounding the Internet, ranging from pedophilia (a favorite topic of the media) to its use by numerous hate groups and illegal organizations. In order to constrain the antisocial dangers posed by all the evil surrounding the Internet, technological and symbolic barriers need to be constructed, “casting all passers-by within a net of suspicion” and “investing greater control in the hands of centralized authorities” (Nissenbaum 2005). This strategy was articulated in the report *The National Strategy to Secure Cyberspace* (February 2003), with which the Bush administration wanted to “engage Americans in securing cyberspace [...] an extraordinarily difficult strategic challenge that requires a coordinated and focused effort from our entire society.”

Of course, this strategy offered a phenomenal opportunity to the Bush political adversaries if properly scripted. Obama wrote that script on the basis of openness, identifying himself with the symbolic element associated to the sacred side of the Internet culture. The self-therapeutic, confessional tone of *Dreams for my Father*, Obama’s autobiographical presentation to the campaign for the presidency, was the first and major embodiment of this symbolic aspiration. By sharing a coherent sense of his life history, he not only tried to show self-awareness, but also a willingness to disclose in a transparent fashion all those events that could potentially carry negative consequences for his political aspirations, and to insert them within broader analytical reflections and political ideas. It was an act of hope aligned with the culture of openness, that achieved a perceived status of authenticity, and that was continuously referred to by the media, unable to gather better elements to disclose Obama’s figure than the ones he himself had already put into narrative motion.

With this background representation safely at hand, it was a matter of narrative flow to extend his image as the hero of the Internet culture, in sharp contrast with the Bush administration secretive practices and securitization narratives. What better way to dramatize these connections than to choose the relatively “open” Google’s headquarters to present the rhetoric of his “open government” policy? On November 14, 2007, Obama gave a major speech in Mountain View that reE-ached into the democratic myth of the Internet, a technology that “empowers us to come together as never before, while letting each of us reach for our own individual dreams.” However, there are dangerous, evil forces that threaten this ideal, that want to “use technology to shut people out, instead of letting them in.” For it is “no coincidence that one of the most secretive administrations in our history has favored special interests and pursued policies that could not stand up to the sunlight.” To reverse this situation, “we have to use technology to open up our democracy [...] open up the government and invite all citizens in” (Obama 2007). Of course, the most immediate indicator of the success of this rhetoric was the unprecedented role that the Internet played in the Obama’s campaign. This was an actual groundbreak-

ing phenomenon, from the point of view of the amount of funding raised from small contributions. Designed by prominent figures of the Internet culture who joined Obama's team as volunteers, Obama's online strategy was decisive in setting the ways in which supporters were organized and communication with constituents was established. "And if you wanna know how I'll govern, just look at our campaign."

After being elected, one of President Obama's first actions was to sign a memorandum committing his administration "to creating an unprecedented level of openness in government" (Obama 2009a). The memorandum divides the "open government" strategy in three lines of action: transparency, participation, and collaboration. These lines have already generated a number of projects and a wide range of applications. For example, the president held an interactive town hall via the Internet on March 2009. Individuals reportedly submitted 100,000 questions and the online community cast over 3.5 million votes. The most popular issues were addressed by Obama in the town hall.

Moreover, there has been a massive incorporation of Internet culture symbols within the communicative structure of the federal government and its agencies, symbols that are themselves in a constant state of open flux: The Obama administration is now "twittering" and many federal agencies have an intense participation in other "Web 2.0" social networking sites such as MySpace, Facebook, or Youtube. Waiting for the advent of the 3.0 rhetoric, institutional "blogging", increasingly popular in the Obama administration, is perhaps the most revealing instance of this symbolic fusion, for it questions the internal premises upon which the ritualistic language of bureaucracy is based (Edelman 1977). As we have discussed above, effective blogging requires a "confessional" individualized narrative that clashes with the incantation of the administrative jargon: general, "objective" and familiar enough to justify any policy in any event. This nullity is however ritualistic in character, for it constitutes an implicit expression of loyalty to the values that are dominant in the bureaucracy. These values generate a "stock" of justifications that keep the organization closed to actual scrutiny or participation. Institutional "blogging" can obviously be based on stock responses, but as a "narrative genre" it entails a number of expectations that tend to open up the ritual of institutional communication to actual consideration and debate with external agents.

In any case, one would expect great social cynicism in judging the actual impact of such promises and approaches, for ultimately, the bureaucratic culture has prevailed to innumerable attempts of being recoded or renewed. However, the fundamental role that the Internet played during the Obama's campaign fits again into the background representation of these proposed changes, thus achieving an unprecedented credit that has even revived the debate about "how much transparency" is actually "good," for bureaucratic institutions (Coglianese 2009). For our limited purposes, the Obama administration's open government policy offers an excellent opportunity to consider more fully the discursive discontinuities between the culture of the Internet as described in previous sections and the culture of bureaucratic apparatuses.

First, the binary openness/closeness should be located at the core of the bureaucratic culture along with the implementation of the Internet as a basic tool for

openness. In another widely cited memorandum, which was circulated through all the heads of executive departments and agencies, and which is obviously available online, Obama (2009b) pushes these symbols in demolishing terms: "In the face of doubt, openness prevails. The government should not keep information confidential merely because public officials might be embarrassed by disclosure, because errors and failures might be revealed, or because of speculative or abstract fears. Nondisclosure should never be based on an effort to protect the personal interests of government officials at the expense of those they are supposed to serve." Here, the "power instincts" that Weber identifies as the cultural engine of the iron cage are elevated to the status of "sacred-evil": closeness means "embarrassment," "failure," self-interest, while the sacred status of national security is delicately coded as a matter of irrationality, if not paranoia. "All agencies should use modern technology to inform citizens about what is known and done by their government"—this can now be done "timely" through the Internet—those who do not identify with this technological synchronization, should be isolated on the basis of the new coding.

Second, a change in the performative tone of transparency and openness is also expected. We have already spoken about the advent of institutional blogging, but there is another instance in the "open government" discourse that is also worth examining in certain detail. Vivek Kundra, a leading young IT government executive, with a strong reputation for his innovative ideas about transparency, was appointed by the president as the first chief of information officer of the White House. In his discourses, Mr. Kundra pushes for a simple idea: All government data files should be by principle available online in "raw" format. He obviously links this with the "open government" coding, and with the interesting notion that this will be an important step to "democratize data." In a number of blog posts, he also demands "help" from the public; help in suggesting datasets that should be published, and help in order to "transform this data in innovative ways" through Internet applications. Data.gov becomes the single electronic space where all these data are supposed to be concentrated, and where debates and innovations take place. This process looks at first sight like an extension of a mere "glasshouse" transparency concept: It is the right of citizens to have access to government data, and the Internet helps rationalize and articulate this right in a technological fashion. Looked at more closely, however, the cultural implications are substantial, for what is actually being "democratized" is the possibility of "telling" this "raw facts" in an open, diverse way, thus dislocating the traditional notion of "expert knowledge" that sustains the culture of secrecy in bureaucratic institutions. Of course, the potential loss of the monopoly of objectivity is immediately perceived by the bureaucrat as an imminent threat to his position: There will not be a pragmatic adjustment to the instrumental conception of the policy as such, as it has not happened before in the history of administrative apparatus. However, crucial to the current plausibility of this process is the symbolic role that data.gov could have in the evaporation of the fear of sharing: If internalized as a totem of the collectivity, the symbolic tokens that elevate the status of power to an end in itself could find a meaningful replacement.

The third element, closely related to the other two, that would indicate the cultural trajectory we are describing here is the existence of a structurally located dis-

course that elevates the Internet beyond its more individualistic conceptions. In the open government policy, this symbolic strategy is embodied by Beth Simone Noveck, an academic intellectual of the New York Law School, who is the second most visible figure of the project of transformation. In 2005, Dr. Noveck was responsible of launching the Peer-to-Patent project, a widely quoted Internet application aimed at connecting the “formerly closed and secretive” US patent office to an open network of volunteers online, who would help, out of a sense of community, with the examination process of individual patents. Noveck’s approach, explained in the 2009 book *Wiki government*, is at the surface eminently pragmatic: by using the Internet and gathering volunteers, public institutions can create more collaborative “mechanisms for solving problems” that simply work better than the bureaucratic ones. Although many experts concur with the notion that networked, horizontal organizations are more efficient than bureaucracies, the accuracy of the theory is less important than its effects on the institutional culture: If enough civil servants and volunteers believe so, they will build open and bigger communities to perform better in relation to given objectives. For Noveck, this is more a matter of collaboration than deliberation, but what is more interesting from our point of view is the symbolic role that she places on the visual character of the Internet: “the importance of designing engagement practices to convey the sense of working together” Noveck argues “bears repeating as the key design lesson. People need to perceive themselves as part of a team, or minimovement, in order for them to work more effectively together across distance” (2009, p. 179). In order to do so, “the screen” must “show the group back to itself,” in the same way that the pile of rocks that hikers leave in their way reflects back the presence of a shared hiking community. This implementation principle, narrated by one of the most powerful “evangelist” (her term) of openness in government, reflects a totemic conception of the Internet. Better performance, when it is disembedded from utilitarian notions of hierarchical power and monetary reward, require an adherence to new collective symbols. Again, the mythologization of the Internet as an open medium is certainly present in the central open government discourses of the Obama administration.

5 Conclusion: Towards an Open Machine?

Is then the Internet culture changing bureaucracy? In its most material, technological conception, there is little doubt that the Internet has penetrated the core of public and private organizations, and that this progress is intrinsically linked to an apparently mundane discourse of means and ends. Many academic visions of this change revolve around the notion that the Internet will somehow lead organizations to become more rational and efficient, with Weber’s analogy of bureaucratic organizations as secretive “machines” looming large at the background. We have to turn to Durkheim to understand what has gained entrance to the machine is not only a technology in the material sense, but a cultural structure, constantly being contested and reinforced through means of symbolic production. There is nothing intrinsically

new about this, for the fusion of bureaucracy and technology has consistently been one of the key organizational principles of modernity. But what is perhaps more distinctive now is that the discursive struggle about what the Internet means has retained a level of autonomy from the narratives of rationalized institutions, as exemplified by the social practices and discourses around open source. WikiLeaks, a website that aims to bring to light secret information about governments and corporations, published in November 2010, 250,000 diplomatic cables that were leaked from the state department in Washington, a moment where the materialization of an open machine indeed seemed to be on the way.

Nevertheless, what we have shown in this work is that if the Internet culture is to transform bureaucracy, it will be because the notion of “openness” gets firmly established in the sacred side of its cultural structure. This is what positions the technology as a symbol of the collectivity beyond the limits of the organization, thus displacing into the sphere of the profane all those symbols that sustain power and money as the fundamental cultural engine of the machine. Deleuze and Guattari wrote:

If Kafka is the greatest theorist of bureaucracy it is because he shows how, at a certain level (but which one? it is not localizable), the barriers between offices cease to be ‘a definite dividing line’ and are immersed in a molecular medium (*milieu*) that dissolves them and simultaneously makes the office manager proliferate into microfigures impossible to recognize or identify, discernible only when they are centralizable. (1988, p. 236).

What proliferates in the fusion of an “open” Internet and bureaucracy is an abstract sense of a broader collectivity, impossible to discern except when it centralizes into particular technological representations, ritual practices, or political events.

This cultural transformation, if ever consolidated into a clear trajectory, will rest on the power of a particular myth. With the global digital diffusion of the Internet presently at around 30%, the Internet is far from being an “open” medium in the way that the discourses analyzed in this chapter imply. Moreover, greater access to the Internet does not directly imply the sort of collective participatory practices that the myth of an “open” Internet presupposes. As things stand, an “open” machine would in actual fact be open only for a few, thus creating a new systematic process of social exclusion as the distance between the actual Internet and the power of its imaginary representation becomes greater. The analytical tools that we have developed in this chapter could be useful to further understand the causes and consequences of this distance, so that proper rational measures can be put in place.

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E-Government Practices in South American Countries: Echoing a Global Trend or Really Improving Governance? The Experiences of Colombia, Chile, and Brazil

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E-government understood as the use of information and communication technologies (ICT) by public agencies to elicit transparency and accessibility has appeared as a fast-spreading policy choice in governments across the world (Foley and Alfonso 2009; Meijer and Thaens 2009) that are looking for instruments to reinforce open government actions.¹ Developing countries have not been apart from this trend and have started to adopt different technology-based actions attempting to increase transparency and public access to government information and public data (Nawafleh et al. 2012). This process has taken place certainly in response to global technological changes and spillovers, but also in response to a sort of isomorphism trends. Yet, since these practices originated in developed countries (McDermott 2010), their implementation still faces important challenges in countries with weaker institutional frameworks and governance structures (Janssen 2012; Meijer and Thaens 2009).

Thus, considering that this policy transfer is taking place rapidly, it is necessary to explore the process through which e-government has become so important in the public agenda of countries such as those in Latin America. Like many others,

¹ We adopt the OECD definition of open government, cited by Gavelin et al. (2009, p. 8), as “the transparency of government actions, the accessibility to government services and information and the responsiveness of government to new ideas, demands, and needs.”

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this is a policy choice that is conducted, oftentimes, without significant evidence of its potential effects, as well as in response to idealistic views or symbolic imagery about its benefits. In fact, considering that the countries in this region have shown an unimpressive performance in the matter of citizen participation and government disclosure (Scartascini et al. 2010), it makes sense to make a review of the process of adoption and adaptation of e-government policies in Latin America. In order to do so, we focus on three South American countries with different economies, populations, and institutions which have recently undertook a particular set of open government practices with the common goal of augmenting transparency, citizen participation, and eventually, government legitimacy.

The main research questions of this work are: What is the focus and the strategy in the main e-government practices that central governments have adopted in these three countries? What are the differences, similarities, and particularities of each country's approach? Is it possible to claim that there has been an isomorphism process from the experiences of developed countries models? Finally, how does the degree of evolution in practices in each country relate to the e-government maturity model presented by Layne and Lee (2001)?

To answer those questions, in the first section we present a literature review of the elements that have characterized the adoption of technology-based open-government policies in developing countries. Then, in the second section, we offer a brief description of the methodology we followed to collect data regarding policies in the three analyzed countries. In the third section, we explore policies at the national level and in the fourth section we explore in more detail the adoption of such policies in two particular cases of public organizations in each country. We finish by providing some comparative elements for discussion in the final section.

1 Literature Review

E-government practices, as the use of ICT in government, have been said to increase transparency and accountability (Bass and Multon 2010; Janssen et al. 2012; Chun et al. 2010), encourage citizen participation and collaboration (Harrison et al. 2012; Robinson et al. 2010), improve effectiveness and efficiency (Feller et al. 2011; Foley and Alfonso 2009; Welch and Pandey 2006), and advance the relationship between governments and the population (Janssen et al. 2012), among other effects. Other authors have aimed to explore the factors that explain their adoption (Meijer and Thaens 2009), as well as their impact (Harrison et al. 2012), which has not necessarily always been found positive (Coglianese 2009; Feller et al. 2011).

However, there is even less evidence as to how this process is occurring in developing countries or whether the claimed positive effects identified in other cases are also taking place here. Thus, it appears relevant to analyze the traits of this process in developing countries, according to the global emulation of policies that has propelled the adoption of those practices worldwide. This is a process that might

be taking place either without an evidence-based decision process, or without an analysis of their adaptability and impact (Janssen et al. 2012; Nawafleh et al. 2012). Latin American countries are not the exception to this trend of policy learning/isomorphism and have started rapidly in recent years to implement practices to increase transparency through new technologies (Criado 2012).

This process of widespread adoption of such practices has become a matter of analysis in the empirical literature showing, so far, mixed results. A group of authors has illustrated the manifold benefits that arise from improving citizen access to government procedures and official data through technologies and other open access actions. Scholars from different countries have concluded that it brings greater legitimacy and recognition for the actions of governments (Macadar et al. 2012), has a strong potential to change the nature of government itself (Feller et al. 2011) and increases inclusion (Peres and Suarez 2012). It seems that e-government policies help to serve purposes beyond the traditional goals of increase organizational effectiveness or citizen access to the government. In this way, such practices can be desirable for developing countries that usually require creative responses to wicked problems and face stringent trade-offs between what should be done and what can be really enforced or implemented.

On the other hand, another bunch of authors has cautioned about the effects of excessive openness on government actions (Coglianese 2009), and the limitations that the actual implementation can bring in terms of institutional capacity (Rose 2005), human competencies, and skills (Krumova 2012; Prieto et al. 2012) or simply the resistance to the adoption of a whole new strategy of adoption of online civil services by public officials (Savoldelli et al. 2012). Yet, most of these studies are not necessarily empirical. An assessment of the actual effects of e-government practices is still pending. This shows that most countries embark in these processes of policy adoption without being completely aware of the potential negative effects or limitations that they will face down the road.

In spite of the absence of abundant literature regarding this topic in the region, some studies have focused on the adoption of such practices in Latin American countries, showing different results. Tapia and Maldonado (2009) explored the policy approach of the Venezuelan government remarking that it has been mainly state centered, as opposed to other comparable countries where the private sector has had a more visible participation. Prieto et al. (2012) analyze the Colombian case, describing the path of its development and portraying some of the limitations it has shown so far. One interesting element of this article is that they describe how they undertook an ample benchmark process in which they reviewed the policies of several countries in order to identify best practices, which might illustrate a classic case of policy transfer. Gomez et al. (2012) analyzed the adoption of online services by the Mexican government. In their review they argued that international visibility was an important factor for this country to undertake some open government practices. Macadar et al. (2012) developed a case study at the subnational level in Brazil, showing how the process of regional adoption follows the national one and how collaboration plays a primary goal on ensuring appropriate implementation.

In conclusion, the literature review indicates that further literature illustrating the empirical effects of the adoption of e-government tactics through the use of technologies and digital tools is still missing. Like Criado (2012) illustrated, it is evident that a rapid process of policy transfer is taking place in this policy domain. It appears that governments all around the world are more exposed to highly visible international rankings and comparisons, and thus feel more urged or are pushed to make hasty adoptions of policies by copying other countries' processes. In this way, analyzing the similarities of three countries in a similar geographic region, but with particular cultural traits and development processes, can illustrate whether there exist elements that evidence similar adoption paths in governments in neighboring areas.

2 Method

In this work, we focused our analysis on actual e-government strategies intended to enhance transparency and citizen participation in central-government processes through new technologies in South America. We aim to explore actions at the national level in order to understand what kind of strategies are followed in such countries in order to increase citizen access through ICTs. In order to do so, we accessed the official websites of national agencies or open-government programs in Colombia, Brazil, and Chile. We rely on official documents and Internet descriptions in order to gather information about the practices of those national administrations. Such revision and the review of some normative information regarding open government allowed us to describe the actual policies that each government is currently pursuing.

In the second section, we aimed to identify similar key organizations (mission, size, activities) in the national governments of Colombia, Brazil, and Chile that have designed policies oriented towards increasing transparency and broader access to public information, as well as citizen participation in government activities and processes through new technologies. To do so, we have chosen two different public organizations in each country. In order to ensure that we have a pair of agencies suitable for cross-country comparison, we aimed to identify two cases that are characterized by strong citizen interaction and high levels of visibility due to their role. Thus, in accordance with such criteria, we decided to focus on one entity involved with tax revenue, and a second one related to private sector regulation.

We recognize that such an approach can produce some limitations in terms of the kind of conclusions that we achieve through the review of practices; however, we think that the cross-country comparison will allow us to understand better particular patterns and trends that have been followed by similar nations with different traits. The fact that this is a recent trend among the governments of developing countries can help us to detect particular events that might have enhanced or hindered such processes in less-developed countries. Identifying such elements is useful to improve the design and implementation of such policies as well as the policy learning across countries.

3 Open-Government Policies, Citizen Involvement and New Technologies at the National/Federal Level

In this section we aim to answer the questions: What is the focus and the strategy in the main open-government practices that central governments have adopted in these three countries? Is there a national agency or department in charge of open-government activities? In general we see that this bunch of South American countries have initiated already comprehensive policies to increase citizen access and disclosure through technology. We will review the experiences, at the national/federal level, of Colombia, Brazil, and Chile before moving to two case studies that we have chosen in order to analyze the adoption of such policies at the organizational level.

Colombia's National Policy

The last two governments of Colombia have pursued a more direct strategy toward expanding the use of ICT to increase citizen participation and accountability. It has been very active at the *de jure* level; it has already regulated in manifold ways the use of digital tools for mass information. Recently, it has become more active in following a strategy to increase the utilization of such technologies at different levels. In this regard, one might identify two main stages in the implementation of e-government policy. In a first stage, the initial actions included the issue of two laws and two policy documents by the early 2000s. One of those policy documents, the CONPES 3072/2000, established the fundamentals of a “Connectivity Agenda,” through which the government started a path to expand the use of ICT in government procedures. Then, as Prieto et al. (2012) show, the government issued the Presidential Directive No. 02, which set the ground for a succeeding wave of actions that have defined a more concrete strategy during the last years. Those two documents appear more specific in the government actions towards increasing transparency and accessibility through e-government.

Another policy document in 2010 (Documento CONPES 3650/201) structured more clearly an online government plan, highlighting the characteristics of the two portals that now constitute the main e-government platform: www.gobiernoenlinea.gov.co and www.contratos.gov.co. More recently, the Decree 2693 of 2012 established the broad outlines of the government online strategy, defining as head of the strategy the recently reformed Ministry of ICT. Since then, it is evident that this ministry has encouraged other public organizations to introduce open-government actions.

In this way, this ministry designed the “Gobierno En Linea” program, which, according to its website, is aimed to promote citizen participation, transparency, cooperation of state agencies, and increase the country's competitiveness. The strategy was also to be implemented by all public organizations at the national level, but it also started as a new program with in-house capacity. It has a staff of 60 employees divided into five different units, each of them in charge of a different

side of the open government strategy. The program showed an important increase in its budget allocation in 2012, showing the government support for the adoption of such strategies.

Furthermore, this approach has already shown some advancement towards increasing the use of technologies for citizen interaction. One clear benefit is that the gobiernoenlinea.gov.co portal unified, for the first time in the country, the access to information procedures and services from several agencies. As a result, now users can access a single platform to perform a wide array of procedures, including services for citizens (e.g., permits and licenses, ID, public utilities), for businesses (exports and imports permits, enterprise register), and public servants (reference letters, public employment, contracting, and public procurement etc.) among others. Another interesting project is the educational website vive.gobiernoenlinea.gov.co which emphasizes a series of procedures that can help Colombians to save time in public paperwork through educational strategies.

On the other hand, in terms of open data policies, the government developed the portal www.datos.gov.co with the purpose of gathering in one single place all the data and statistical information published by Colombian public agencies. Similarly, it has developed a complementary portal www.aplicaciones.gov.co which concentrates 64 third-party applications that are useful for use of public information. Although both portals are in beta (not definitive) version they have already become a source of greater government disclosure.

Finally, there is one interesting case of a website intended to increase the participation in government. The website www.urnadecristal.gov.co is the portal for the state to increase and enhance accountability through allowing citizens to complain, have a say about government policies and/or make suggestions regarding particular services. In the website, citizens can easily publish comments and interact with the organizations and their public officials. It also allows contact between citizens through different social networks and encourages their participation in government procedures. Although so far there are no measures of how effective is such strategy in generating more effective participation, it seems evident that Colombian nationals now have more ample tools to participate or at least be heard by government organizations thanks to the greater use of information technologies and digital tools.

How is this strategy working at the organizational level of Colombia's central government? The analysis of the websites of 16 ministries and other six main agencies at the central level of Colombia's government reveals that still there is a lot of heterogeneity in the adoption of e-government strategies. Although some of these agencies show their information in a friendly and accessible manner to users, most of them have evident deficiencies that still hinder citizens' access and transparency. It is very frequent to notice in those pages outdated information, inactive links, and/or old-fashioned platforms and services. Similarly, it is noticeable that most pages do not portray clearly the platforms for user participation, something that could hamper access and user participation on the site.

Likewise, there is no uniformity regarding the official names and labels of similar public services in different organizations. This makes it evident that a more comprehensive approach is still needed. Just to mention one of the flaws, in most

organizations' pages some links were disabled, outdated, or connected to other websites whose content is damaged or outdated. Nonetheless, one remarkable fact is that almost all the websites of those central level organizations have direct links with the portal gobiernoenlinea.gov.co.

Brazil's National Policy

E-government in Brazil is a federal government program. The executive committee of e-government (created by Decreto de 18 de Outubro de 2000) regulates actions towards making government more open to citizens through ICT. The whole process started in the 2000s with the creation of a so-called Interministerial Working Group aiming to examine and to propose policies, and guidelines to allow new forms of electronic interaction with the citizen. Nowadays, the executive committee is under the supervision of the ministry of planning and has several participants from other ministries. According to the executive committee website (<http://www.governoeletronico.gov.br/o-gov.br/principios>), the main aims of the committee are: to promote citizenship and digital inclusion, to encourage the use of free software, to employ knowledge management as a means to articulate e-government and public policies, to optimize resources, and to integrate actions with other levels of government (regional and local). The Brazilian e-government structure has the executive committee, which is a technical committee in charge of conducting and controlling open-government projects, along with the Secretariat of Logistic and Information Technology.

As of this moment, the Brazilian government has several projects for improving citizens' access and transparency:

- Accessibility: The citizens have access to software and documents that help them to build websites in order to interact with government web portals
- Broadband/Info via: A program intended to expand high-speed Internet coverage in order to facilitate the access to government websites and services.
- Open data: Publication of easy-to-use government procedures aiming to make them more available and understandable to the citizens. This aims to improve transparency, participation, and the possibility of generating knowledge through collaborative scientific investigations.
- Electronic purchases system: A series of systems developed for fulfilling and monitoring electronic purchases. It includes a suppliers' database and information about bidding, procurement, and information about goods, services, transportation tickets, and allowances.
- Interinstitutional agreements: In order to improve transparency and social control of the resources transferred to states and municipalities, the Brazilian government created the federal government inter-institutional portal.
- Domain management: The executive committee regulates the creation of ".gov" domains in order to keep it safe of fraud and bad use
- Government to government: It is an attempt to make the whole network of government systems interconnected and functional

- Digital inclusion: It is an ambitious public policy aiming to take digital inclusion to every citizen in the country. It encompasses initiatives such as broadband to schools, computer to everyone (aiming to reduce the price of laptops), and so on.
- Free software: It is a strategy for generating knowledge and intelligence in this domain in order to reduce costs by expanding the competition among software producers.

This indicates that the Brazilian government has started the whole process of adoption of advanced open-government practices through technology, although most of them apparently are still developing and increasing access to citizens.

Chile's National Policy

Chile is a highly centralized state. This trait can also be found in the manner in which the general e-government agenda has unfolded. Starting in 2008, the Chilean government enacted the Law 20.285, and since then a group of regulations has been put in place to implement the ability of citizens to access public information.² Public agencies have to abide by these regulations, making access to public data easier for all citizens. Similar to Brazil's and Colombia's, in the Chilean approach to e-government initiatives are linked to two main concepts: open access to public information and ICT to increase public participation in government activities. In the first domain, the milestone is the enactment of the Freedom of Access to Public Information Law (20.285) in 2008. This law opened public agencies to public scrutiny, allowing citizens to access information regarding topics such as salaries and contractors. It also defined fines for public managers who were unwilling to provide information considered as public. The FOI (freedom of access) law made a significant change in defining standards for public officials in terms of what has to be available on line, and how citizens could acquire public data. The 20.285 law was conceived under the idea of "active transparency." The government has to make information available regardless of the intention by citizens to require it.

The second legal initiative aligned with open government initiatives is the associations and participation in public management law (20.500) in 2010. This initiative is aimed at creating the conditions for public participation in public management and "fostering a culture of co-responsibility, promoting and providing orientation in the involvement of citizens in improving efficiency and effectiveness of public policies" (www.gobiernoabierto.cl). In 2011, the Chilean government became part of the open-government partnership (OGP). Since then, it has been working on several projects to meet the OGP standards in five areas: improving public services, increasing public integrity, improving the efficiency of public expenditure, creating

² Several regulations have been in place by the Ministry of Finance, the Transparency Council, among others, to improve the system in terms of standards, procedures and applicability. The web site <http://www.gobiernotransparente.cl/asistente/documentos.php> provides a list of these regulations.

safer communities, and increasing the institutional responsibility.³ In 2013, the Chilean government issued a report presenting improvements for each aforementioned area. Most of the information regarding this participation is available on the website <http://www.gobiernoabierto.cl/>, where citizens can have the chance to access public data, share ideas to improve public agencies, and make queries, among other tools.

In spite of these legal and governmental initiatives, the real impact among citizens is still limited. For instance, the Transparency Council created by the Law 20.285, presented a study where only 12% of the sample knows that a specific institution exists to allow freedom of access to public data.⁴ In normative terms, citizens are interested in these issues, but the real and potential impact in terms of accountability is still limited. So far, Chile appears to be in a similar stage than the Brazilian counterpart, most programs are still in a preliminary phase.

4 Country Cases of Electronic Government Practices at the Agency Level

In order to explore the organizational adoption of such national guidelines we decided to analyze the cases of two specific organizations in each of the three countries. To do so, we have chosen two different public organizations in each country. Thus, in order to ensure that we have a duo of agencies suitable for cross-country comparison, we aimed to identify two cases that are characterized by strong citizen interaction and high levels of visibility due to their role. Thus, according to such criteria, we decided to focus on one entity involved with tax revenue, and a second one related to private sector regulation.

Accordingly, the first case that we have chosen for comparison is the tax collection agency of each country. We selected such agencies as good cases for analysis considering the frequent and strong interactions they perform with citizens. By analyzing their e-government strategies, we aimed to identify how such organizations have improved control, collection, and transparency by making easier the participation of citizens and taxpayers into their processes through digital tools. On the other hand, we have chosen the aviation regulation authorities/agencies, which are now in the spotlight for their role in passenger safety and the performance of airline companies and are subject to strong demands of disclosure and transparency by the private actors they regulate. Thus, in the following section we explore the Colombian, Brazilian, and Chilean cases of e-government adoption at the tax revenue and the civil authority agencies.

³ <http://www.opengovpartnership.org/countries/chile>.

⁴ <http://www.consejotransparencia.cl/chile-es-mejor-pais-de-lo-que-los-chilenos-creen/consejo/2013-03-14/113208.html>.

Colombian Cases

Tax and Customs Office (DIAN)

The website of the Tax and Customs Office of Colombia (DIAN—Spanish acronym) allows 35 procedures and services regarding to taxes, 40 procedures related to customs clearance, three for users abroad, and five regarding exchange controls. In terms of information systems for the user, the citizen can access five different microsities to make direct queries regarding tax issues. Each of these links is properly designed and guides the user through specific steps to achieve the desired result. However, despite the importance of these “microsites,” these are not in a visible location on the main page of the entity, which makes access to these services is very challenging.

With respect to direct citizen services, there are 36 different procedures that can be queried and placed online (classified by the type of procedure: tax, customs, and exchange control). They may also perform procedures regarding imports and exports. Similarly, the users can download forms and obtain information regarding sales and auctions. The website also provides access to the main taxes software, the MUISCA system, which provides a user platform for citizens to make comments and get timely response by the body. The website of this organization states that users can consult the DIAN through ten different channels including telephone, electronic mail, chat, and virtual forums.

It can be generally argued that this organization has a developing platform to increase citizen participation and transparency. The portal hosts on its homepage the most important services and consultation that can be reached by citizens. The DIAN has strong involvement in social networks. Accessed on 27 March 2013, the social network accounts show that the DIAN has 7,529 followers on Facebook, 17,372 followers on Twitter (2,911 tweets), and 65,090 video views on its YouTube channel. Finally, we note that most links are updated (with some exceptions), it is possible to view basic information in English (mission, vision, etc.) and there is information that guides the user in terms of accessories and browsers required for proper operation of the site.

Civil Aviation Authority of Colombia (Aerocivil)

The website of the Civil Aviation Authority of Colombia shows complete information about airlines and passenger procedures that can be downloaded in PDF files, Word, Excel, etc. Similarly, within the online information services, there are information about airfares, itineraries, airport information, special permits, and information related to passengers, pilots, and airlines. The website also portrays information for suppliers, entities state officials, and airmen, but the links appear to be disabled (accessed March 2013). With respect to aviation authority, it is remarkable that it provides information regarding the licensing process of aeronautical personnel, key

statistics, and everything related to the surveillance, control, and investigation of accidentally.

As for the information relevant to pilots, the Aeronautica Civil's website offers information regarding air navigation services (i.e., committee incident investigation and prevention, meteorology, navigation plan open, and other procedures). It is remarkable that the wide supply of aeronautical information services through its website: aeronautical information circulars, checklists, and one application showing all the airports in Colombia (on a map, with basic airport data) and information on the status of volcanic activity.

In relation to public participation, it is possible to surf the directory of all officials in the agency (airports and dependencies), FAQs (classified in 19 groups and a total of 123 questions), the duties and rights of the passenger, and a web portal for children, which has basic information on aviation, and the main functions of the entity. The Aerocivil has still a low presence in social networks; its Facebook account has 1,459 likes, while its Twitter has 1,089 followers and 328 tweets as of March 2013, and has 62 subscribers to YouTube. It also offers access to other systems of participation (chat and forum).

Brazilian Cases

The Secretariat of Federal Revenue

According to the Secretaria da Receita Federal (Secretariat of Federal Revenue—SRF) website, it is responsible for the administration of the whole set of taxes that are under the federal government jurisdiction. These taxes include social security contributions, taxes on foreign trade operations, and a significant share of the country's social contributions. The organization is structured as in Fig. 1 and it has a central office in Brasilia and several decentralized units scattered throughout the country.

In terms of e-government in this tax organization, the Secretariat provides access to the general people through several channels, namely E-CAC Portal, personal attendance, attendance by partnership, phone, and the Internet. Citizens to the services provided have created all of these channels in order to improve access.

According to data available at the SRF website, the website was accessed seven million times by people trying to do an assorted set of activities regarding tax, payments, information, and so on.⁵ Figure 2 shows how people accessed SRF. The huge majority of the access was done through E-CAC, which is a service in which citizens are able to solve several problems regarding to their fiscal situation, such as download registrations of payments done, to obtain a certificate of debt discharge, and several other related services. According to the figures, from all the different channels, citizens search access to the information mainly through the E-CAC portal (apart from other internet channels).

⁵ Specific data regarding unique accesses, requests or page views are not available.

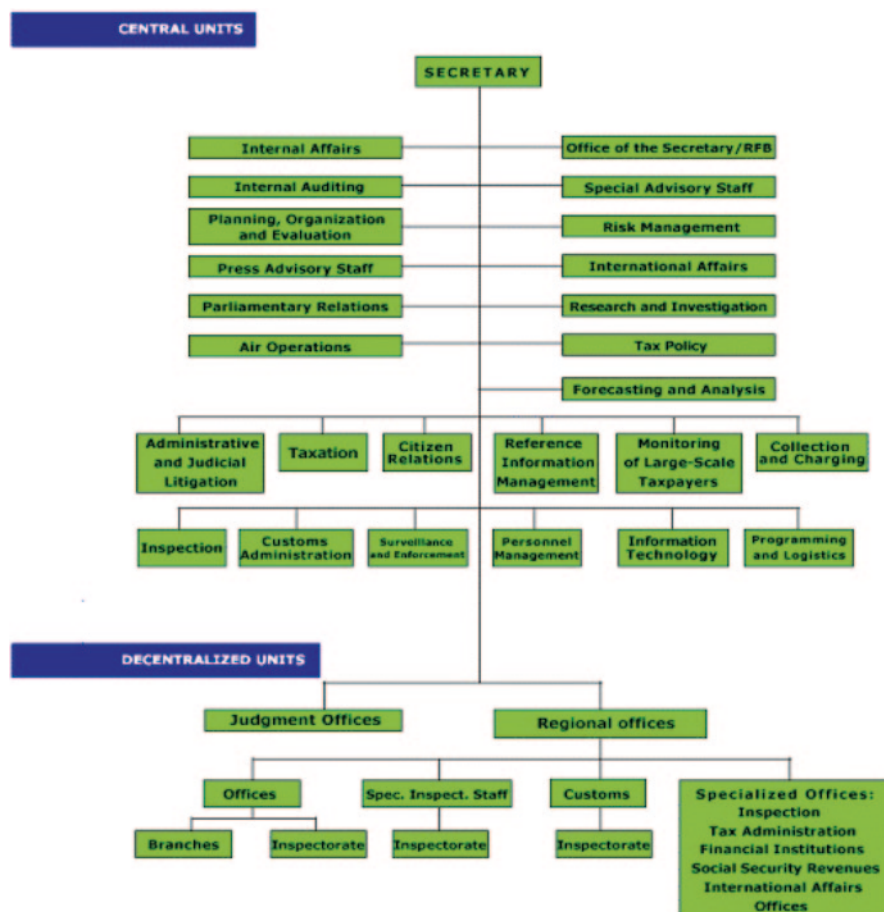


Fig. 1 Administrative structure of the secretariat of federal revenue. (Source: <http://www.receita.fazenda.gov.br/principal/Ingles/Estrutura/Introducing.htm>)

Figure 2 indicates the sort of services citizens' access through E-CAC. Around one million people do access, as they need to know their fiscal situation, e.g., whether there is any debt associated with their CPF (physical personal registration). This information is required if the person wants to open a bank account, contract loans and mortgage, or even achieve a professional position. Around half a million people access the system to download a copy of the annual declaration of revenue as a whole or parts of it. It works as an official document to attend requirements of proof about personal wealth. A little less than half million people access the system as they need a receipt for some payment made to the SRF. Other people access the system because they need information about how to fill up the annual declaration of revenue, and figure out their pension fiscal situation.

According to information provided by SRF officers, the secretariat is improving e-government in order to speed up the process of attending people and for improv-

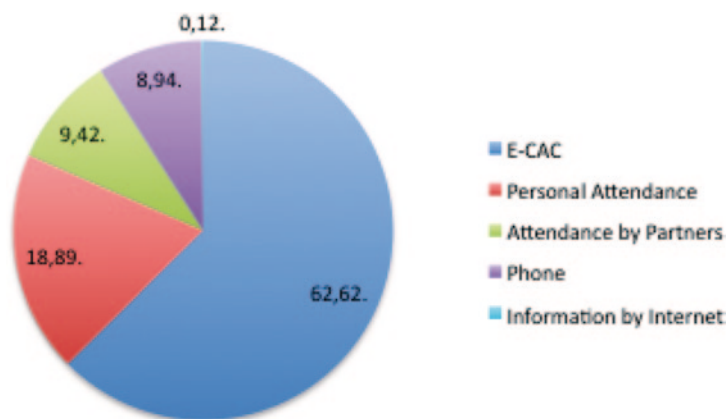


Fig. 2 Access for 2012 Brazilian federal revenue. (Source: Secretariat of Federal Revenue website (www.receita.fazenda.gov.br))

ing the security of information provided. Nowadays, the process of submitting the annual declaration of revenue, which must be done by the last day of April, is done through the Internet and no paper is produced in the process. It is also a process over which citizens have total control over the time and place they are willing to do it. About 10 years ago, some people needed to hire an accountant to help them filling up the information required. Now, the system provides information about all the data needed and it has a mechanism that advises whether information is wrong or missing.

Besides, the most popular service the SRF has, which involves around 26 million annual declarations, the Secretariat also has services to facilitate the connection with companies and with the government, whose service is to transfer money that is deducted from payrolls monthly. In order to improve quality and security of such services, the SRF has also created several systems, which are available online, which seems to be the case of importation taxes and conditions, payment of tax and debts, certification of payments, and declarations as well. As a matter of fact in 2012, the access to the E-CAC regarding “fiscal situations” reached a number of 965,551, while “last declaration records” was 537,119 and “receipt of payment” 412,560. At the end of the list, 363,329 hits were related to “messages” and 3,249,329 to “pension situation.”

National Agency of Civil Aviation (ANAC)

ANAC is a regulatory agency in charge of regulating and supervising the activities carried out by aerial transportation companies. The regulatory activities performed by ANAC are both technical and economical. Technical regulation refers to the operational and security aspects of the industry and involves putting to practice norms and rules for ensuring that the companies are working according to severe norms

of security in the whole service delivery chain. Economic regulation refers to the monitoring of the market in order to ensure efficiency and economy, trying to avoid practices that would make some sort of prejudice to the service users.

For ensuring open government, ANAC publishes reports and everybody can have access to them at the agency website labeled as transparency (www.anac.gov.br). On this website, one can access information about the agency, which varies from activities related to the agency employees to public hearings in which anyone has a say on the definition of rules and regulation that will shape the functioning of the service delivery process. Below, some of those channels of communication are presented.

- **Personal and services bulletin:** Published since 2006, this report publishes information regarding human resource management in all aspects, such as training, allowances, promotion, and tenders for contracting personnel.
- **Regulatory performance reports:** Published since 2008 (some of them in English), these reports aim to provide transparency to the activities performed by the agency, which includes technical and economic regulation activities, relationship with users, and figures of performance.
- **Minutes of directorate meetings:** Published since 2006, these reports aim to publish the subjects dealt with in every single meeting involving the directorates.
- **Public Hearings:** Carried out since 2007, public hearing is a means by which the agency has to provide opportunities to society to opine on regulations to be set down and on the quality of the services provided, for instance, the increase in the number of flights, and airports renovations. The public hearing works starts with the publication of a summons in a large circulation newspaper and through the media. Those interested are then informed how the participation is going to happen and a form is made available to them place suggestions, which are analyzed afterwards and a response is provided to every person that contributed.

Electronic government process in ANAC happens to the extent that the society is instigated to collaborate making suggestions on how services are to be delivered and on the construction of regulatory mechanisms. The agency also adopts a very transparent approach in the extent that a great deal of its meetings and activities are made public through reports published at its website.

Chilean Cases

Internal Revenue Service (Servicio de Impuestos Internos)

After presenting the general framework of e-government in Chile, two elements will be presented to address how two public agencies implement e-government. This effort is intended to show that general regulations have created an important level of homogeneity in this area of the Chilean public sector. Figure 3 is a screenshot of the information provided by the “Servicio de Impuestos Internos” (SII) fol-



Fig. 3 Chile: Internal revenue service

lowing the standards and criteria set up by the Transparency Council and other entities involved in implementing active transparency in the Chilean public sector.

This information is complemented by the SII in its web site, with information regarding taxes, but most important, a remarkable system to access almost all services required by this institution such as income taxes, property taxes, and so on. According to the Law 20.500, public agencies have to clarify mechanism to ease citizen participation. In the case of the SII, four actions are in place: the annual public hearing, advisory council, channel of participation, and a system to administer information complaints.⁶ As it was already mentioned, public participation initiatives are limited to advisory or information channels, where citizen can only get information and little influence can exert in terms of the decision-making process.

General Directorate of Civil Aviation⁷

Figure 4 provides the same screenshot of the website the agency is obligated to keep to abide by the notion of active transparency. A few elements can be pointed out as different with those present in Fig. 4, showing that the Chilean government has taken concrete steps to make information homogeneous within the public service.

In terms of citizens' participation, the only mechanism that the agency declares in its web site is an annual public hearing. It is only an activity to provide information in terms of the actions carried out in a given year by the DGAC, without any other reference to public participation. However, in an internal regulation enacted in 2013, four citizen participation mechanisms are formalized: citizen consultation,

⁶ http://www.sii.gob.cl/transparencia/participacion_ciud.html

⁷ <http://www.dgac.gob.cl/transparencia/>



Fig. 4 Chile: General Directorate of Civil Aviation

civil society council, access to relevant information, and public hearings. So far, only information regarding the last mechanism is provided in the website.

5 Comparative Insights and Elements for Discussion

From the analysis, we can conclude that, thanks to starting e-government programs, the three South American countries have been (at least according to the issued policies) engaged into making government more transparent and easy to work with, as they have been making available new channels through which information can flow to the general public. We also observe that the amount of services has increased and people have access to greater sources of public data. The extant data does not allow us to offer a more clear account of the level and the kind of interactions generated through the different channels. Those actions are consistent with the initial paths of governments in other countries that started allowing access to some public information and timidly providing some web-based services. In general terms, apparently there is still no evidence of local adaptations or in-house developments that diverge from the previous practices of developed countries.

At the national level, most policies seem to be at a primary stage in the three analyzed countries. It is evident that all of them have already e-government programs designed, which are now in primary phases of implementation. Each of them has also now fresh organizations, with certain administrative capacity, which are in charge of ambitious agendas inside the national administrations. In general terms, it is remarkable how these three South American countries have adopted this topic as an important item of the public policy agenda. E-government appears to be an important priority during the recent governments of these developing countries.

Table 1 Cross-country case analysis

Agency	Mechanism	Brazil	Chile	Colombia
Tax collection agency	Public hearing			
	Making queries	✓	✓	✓
	Self-service	✓	✓	✓
	Consultation	✓	✓	✓
	Little influence on decision making	✓		
Civil aviation Authority	Public hearing	✓	✓	
	Communication channels	✓	✓	
	Transparency	✓	✓	✓
	Basic procedures			✓

By means of the Layne and Lee model (2001) we might be able to identify some differences at both the national and the agency level (Table 1). Whereas all countries appear to be already in the second stage of Layne and Lee maturity model, it seems that Chile and Brazil are moving at a faster pace towards a stage of vertical integration (meaning local systems linked to higher-level systems). In the Colombian case the national agenda is developing new spaces to generate such integration but most of the tools are still far from allowing high levels of interaction and self-service by the user. At the agency level, the two agencies in both the Chilean and Brazilian cases appear to be more interactive and have evolved faster towards greater complexity than their Colombian counterparts.

Yet, it seems that according to our definition these countries seem to be following the initial stages that more advanced countries have followed before (creating presence, then transaction, vertical and horizontal integration), and in this way some form of isomorphism might be identified. According to the practices that we have reviewed, apparently there is some form of isomorphism among these three countries, something that authors like Criado (2012) have already remarked about the Latin American process. Even so, such a process is expectable since internationally most countries have appeared to follow the actions of pioneer countries creating convergence (Criado 2012, p. 78). However, open government is a concept that goes beyond the mere adoption of technologies for increasing citizen access and transparency, and this is something that is not still completely evident in these South American countries.

Although at the national level apparently there are not significant differences among Colombia, Brazil, and Chile, some particular traits emerge at the organizational level. According to the cases, Brazil and Chile appear to be moving more rapidly towards more complex ways of interaction and integration. Whereas Colombia seemingly still needs to take some actions towards greater citizen access and effective disclosure across government at all organizational and territorial levels. Nonetheless, it is evident that in all cases the steps taken in the last years are positive. It is observable that in the three countries some of the initiatives have had the intention of making people's lives easier by also attempting to reduce red tape and undesired procedures. For instance, by offering new channels and tools for paying

taxes and accessing information and other several procedures that now can be done from home with the help of a personal computer.

These initiatives seem to be aligned with the idea of results oriented government, a trend that has been very strong in the region during the last decades and thus might help to enforce the adoption of e-government. Accordingly, these countries have adopted strategies to streamline procedures and paperwork in government actions. However, the question remains about the real impact of these actions on government effectiveness. Do these actions really encourage disclosure and citizen participation? Or are they a new component of the politicians' electoral strategies? Although those questions go beyond the scope of this exploratory work, it is evident that the Latin American governments are emulating the actions followed years before by developed countries and still need to move forward towards a more indigenous use of technologies to enhance actual citizen participation.

This is an enormous challenge in the midst of populations strongly divided by the level of access to new technology. The actions of the governments in these Latin American countries are merely beginning this process. That might be good news since they still have the opportunity to go beyond and design their own strategies to ensure the empowerment of citizens' access in highly unequal societies. According to our review of both national policies and the cases reviewed in this work, it is apparent still that few opportunities are provided to the population in these countries to actually engage in public policy formulation and decision making. True, it is positive that these countries are following an international trend, but they still need to advance to set their own paths to ensure greater openness. At the end of the day, e-government is most a matter of people and citizens connected, people being heard and allowed to participate and collaborate in the actual policy process.

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Can Open-Government Models Contribute to More Collaborative Ways of Governance?

An Assessment of the Greek OpenGov Initiative

Evika Karamagioli, Eleni-Revekka Staiou and Dimitris Gouscos

1 Introduction

Facing the decrease of voters' turnout and of civic participation in political processes since the 1980s has long been one of the main challenges of modern governments both in the USA and the European Union (EU; United Nations 2012; Karamagioli 2013; Veenstra et al. 2011). According to Castells (2010), information and communications technology (ICT) and the Internet in particular is presenting a new political network dynamic, which is expected to function as an instrument for furthering democracy, in terms of "informational politics". This notion points to the enabling potential of Internet to foster new, dynamic forms of democracy, mainly by functioning as a horizontal communication channel allowing polyphonic discussions as well as one-to-one dialogues. This development can be viewed as a positive advancement towards an open and "citizen-friendly" form of government, one that shapes its policies in the interests of the citizen.

The Greek political landscape and the way public administration and political procedures are performed can be an ideal field of study of how the Internet can work in this direction. Nowadays, the country is facing the most intense social, political and economical crisis of her history, and a series of political issues over the last decade have caused widespread public mistrust, which has in turn contributed to the establishment of long-standing tendencies of cynicism, cronyism, political clientelism, civic disengagement and finally to a deep feeling of disappointment for the inefficiencies of public administration (Transparency International 2012; OECD 2011).

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According to Organisation for Economic Co-operation and Development (OECD), a cohesive society is the one where citizens have a high degree of confidence in their governmental institutions and public administration. In Greece, 44 % of people say they trust their political institutions, which is less than the OECD average of 56 %. High voter turnout is another measure of public trust in government and of citizens' participation in the political process. In the most recent elections for which data are available, voter turnout in Greece was 62 % of those registered. This figure is lower than the OECD average of 72 % (OECD 2011). Additionally, almost all Greeks (at an estimate of 98 % according to OECD 2012) consider that corruption is a major problem in their country. About seven out of ten respondents of the general public in Greece consider the anticorruption efforts of the government as ineffective or extremely ineffective, whereas political parties themselves are considered as corrupted institutions (European Commission 2011). In 2012, Greece scored as the lowest-ranked EU country in an index that measures experts' perceptions of public sector corruption: Greece's low position (94 in this ranking) is illustrative of the "crisis of values" that is driving the economic crisis (Transparency International 2012).

In order to face this credibility deficit (Itamo 2010), and following EU's recommendations and worldwide trends, the Greek government has initiated a series of open government initiatives in an effort to address the lack of accountable leadership.

The objective of this chapter is to present the Greek OpenGov.gr case and its results as a top-down eParticipation effort. By analysing its key components and its way of functioning until today, we will discuss if and how it has managed to start addressing a number of flaws of the Greek political and public administration system and actually helped to move towards more collaborative models of governance. In parallel, through this analysis we intend to identify and discuss similarities, complementarities and differences between the concepts of eParticipation and open government in the sense that one of the major challenges for open government is to integrate a "deliberative-participatory element" into existing political structures and procedures.

2 Methodology

The analysis of the OpenGov.gr case as a top-down initiative, which was government-led and mainly dealt with linking citizens to legislative processes at a national level, includes an extensive literature review along with the presentations and analysis of all publicly available data that concern the usage of the OpenGov.gr platform. In the following sections, analysis will focus on two projects that were the first to be fully implemented: electronic consultations and open calls for the recruitment of public administration officials.

Concerning the review of literature and the theoretical analysis performed so as to strengthen argumentation, articles were selected by searching three major library

databases (ISI-Web of Science, EBSCO Host and IEEE Explore). In addition, a number of relevant conference proceedings were considered, as well as reports and surveys from international organizations (United Nations, OECD, European Commission etc.) and nonprofit organizations such as Transparency International. The keywords eParticipation, open government, transparency, accountability, openness and political process were used to identify the relevant literature.

For the collection of quantitative data, we used data available from the website OpenGov.gr. Also, we used the service Google Trends to obtain data about the traffic of the website. Finally, for the measurement of the publicity of the OpenGov.gr website in Greek blogs and websites in general, the Google search engine was used with custom search terms and time periods.

Limitations in the following analysis concern (a) the lack of updated official data (data available cover the period until 2012) and (b) the lack of an official evaluation mechanism that would provide a well-rounded and holistic view of the OpenGov.gr initiative, as mentioned in the concluding section of this chapter.

3 Open-Government Models and eParticipation Experiments: Linking Governmental Transparency and Accountability to Citizens' Participation in Policy-Making

According to the open government doctrine, citizens have the right to access the documents and proceedings of the government to allow for effective public oversight (Lathrop and Ruma 2010). Open government is an innovative strategy for changing how the government works and helping increase government transparency and accountability at every level. By using network technology to connect the public to government and to one another informed by open data, governments ask for help in solving public problems. The end result is more effective institutions and more robust democracy.

Open government is described as an all-embracing label for a more transparent, accessible and responsive governance system, where information moves freely both to and from government, through a multitude of channels. In such a system, sharing information is the norm within the public sector and significant resources, training and administrative procedures are devoted to the effective dissemination of knowledge and services.

President Barack Obama has been a pioneer of open government. In his memorandum on transparency and open government, issued on his first day in office, he committed the US government to “establish a system of transparency, public participation, and collaboration”. According to him, three principles are essential to open government: (a) government must do everything possible to make information available and useful; (b) government must create venues for citizens, stakeholders and employees to share ideas, opinions and priorities; and (c) government must reach across internal and external barriers to solve problems collaboratively

(Obama 2009). Obama's memo was a signal moment in the history of open government, issued by a president who gained office in part by opening his campaign to allow his supporters to shape its message, actions and strategy using online tools.

The creation of the data.gov website by the US government is one of the most substantial steps taken in this direction. Launched in 2009, the website functions as a clearing house for datasets generated by the government in an accessible, developer-friendly format. The UK is following a similar path towards the creation of websites that will serve as a single point of access to public data with data.gov.uk site, launched under the direction of the founder of the World Wide Web, Sir Tim Berners-Lee. Similarly, Denmark has the digitaliser.dk data portal run by the Danish National IT and Telecom Agency. In France, the portal of public data data.gouv.fr under the authority of the prime minister and attached to the secretary-general of the government is responsible for operating as a single portal of public information.

For the EU, the importance of public access to information and decision-making is considered as one of the key solutions to its alleged lack of democracy. The Treaty of Lisbon, in particular, in a section dedicated to "Provisions on Democratic Principles", stresses that "Every citizen shall have the right to participate in the democratic life of the Union. Decisions shall be taken as openly and closely as possible to the citizen." Moreover, the institutions shall "by appropriate means, give citizens and representative associations the opportunity to make known and publicly exchange their views in all areas of Union action." These priorities for opening up public governance processes to democratic citizen participation are embodied in efforts for open government and electronic participation.

OECD (2005) defines open government as "the transparency of government actions, the accessibility of government services and information and the responsiveness of government to new ideas, demands and needs". Together, these three building blocks are seen to support a number of benefits for government and societies: improving the evidence base for policy-making, strengthening integrity, discouraging corruption and building public trust in government. According to researchers such as Heckmann (2011), open government can be a "transformative" tool in that it offers the potential to reformulate transparency as more than a "stabilizing factor". Web 2.0 technologies level the playing field of public dialogue in unprecedented ways as they allocate communicative tools in a more egalitarian manner. The public, therefore, gains significantly more leverage not only concerning access to information but also interpreting and disseminating such information without recourse to conventional democratic and societal structures.

eParticipation, on the other hand, according to the broad definition offered by Macintosh and Whyte (2008), consists of the usage of ICT in order to enhance and deepen the political participation of citizens. The use of electronic technology in all public activities and societal processes, including participation in political opinion shaping, decision-making and the provision of public services ("e-services") is able to strengthen constitutional principles and public engagement by individual citizens as well as interest groups. Ideally, this increased level of interaction between citizens and politicians can strengthen democracy. eParticipation, therefore, is considered as a means to empower the political, socio-technological and cultural capabilities of individuals employing different techniques: Tools can be variously

used for increasing transparency, enhancing citizen participation or improving the quality of opinion formation by opening new sources of information (Panopoulou et al. 2010; Sæbø et al. 2008).

The concepts of open government and eParticipation are obviously related, without, however, coinciding on their detailed objectives and agendas. Ideally, they can cross-fertilize each other and bring forward more active forms of citizen involvement in governance, with citizens not only participating by providing their opinion, but also being more active in setting the agenda of discussion, and even more active by working together with governments to develop new services. However, these advancements are by no means automatic; it is quite important to better understand how the critical success factors of open government and eParticipation initiatives relate, as well as how open government initiatives can actually contribute to more participatory and collaborative forms of governance.

According to Angel Gurría, OECD secretary-general, openness and transparency are key ingredients to build accountability and trust, which are necessary for the functioning of democracies (OECD 2013). Higher standards of transparency increase accountability for decisions and provide less opportunity for self-interested abuse of the system and the opening-up of data makes it easier for citizens to monitor their government's activities including the services they provide, how efficiently taxes are spent, lobbyist activities, electoral activities and corruption. However, we need to focus on a distinction. There is a great difference between access to data and access to information. Sometimes, a large amount of raw data is available to the public, but the actual information is not. Data themselves do not mean anything if the citizens do not know how to analyse and explain them (Allison 2010). Given the lack of trust in the politicians and the political system in general, there is a lack of trust in their data as well. As Swartz (2010) mentions, "If you can't trust the regulators, what makes you think you can trust the data?"

4 The Greek Government's OpenGov Initiative

The Greek OpenGov initiative started to be available to users in 2009, just 2 days after the national elections in an effort to rebuild citizen–policymaker relations in the troubled time the country was undergoing and to serve the principles of transparency, deliberation, collaboration and accountability, which had been the flagship of Pan-Hellenic Socialist Movement (PASOK) during its political campaign (Rigou 2010). The challenge was to address the problems that characterize the Greek society for decades such as the decline in citizen engagement in the public sphere, public apathy and dissatisfaction as well as corruption in the public sector.

In its early days, OpenGov.gr included only two initiatives: electronic consultations and open calls for the recruitment of public administration officials. Nowadays, the project has expanded and includes initiatives such as geodata.gov.gr, a catalogue and web mapping framework providing open geospatial data to citizens built exclusively on open source technologies and standards; the open taxation data initiative aiming to improve the accountability, reduce the bureaucracy and increase

Table 1 Number of services hosted in OpenGov.gr since its launch. (Source: opengov.gr website)

	Oct. 2009	Nov. 2011	Apr. 2013
Electronic consultations	2	215	239
Open calls for the recruitment of public administration officials	2	135	140

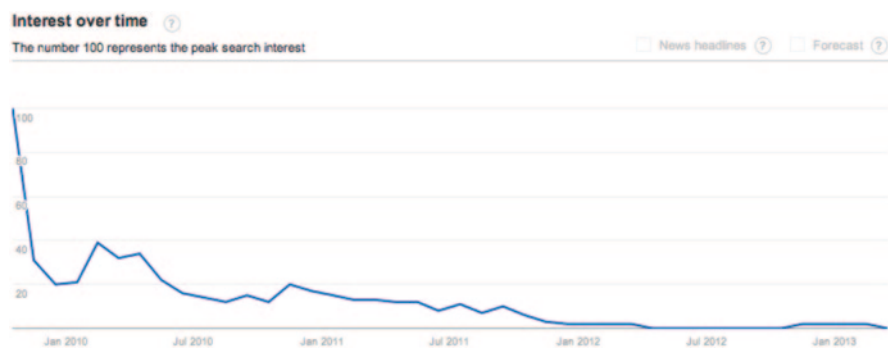


Fig. 1 Public interest in OpenGov.gr (search interest during 2009–2013). (Source: Google Trends, <http://www.google.com/trends/explore#q=opengov.gr&date=10%2F2009%2042m&cmpt=q>)

the transparency of Greece's taxation system, offering extensive statistical data from the year 2000 onwards and last but not the least, Di@vgeia, a portal where all public decisions are uploaded. The OpenGov platform was developed in-house, by the Greek Research and Technology Network (GRNET) team using open source software, and it is now supported by the Greek Centre of Public Administration. It is hosted on virtual machines, by repurposing existing infrastructure and underutilized ICT resources already owned by the public sector.

As already mentioned, the analysis that follows focuses on the services for electronic consultations and open calls for the recruitment of public administration officials which were the first to be implemented. The number of transactions using those services increased significantly from October 2009 to November 2011 and slightly afterward until today, although not all the ministries participate in the consultation process, which might further increase their use (Table 1).

Concerning public interest, after an expected rise during the initiation of the project in 2009, there was an important fall of interest with peaks until mid-2011, which were connected to specific deliberations of high public interest open during certain time periods. In general, the number of the visitors for this first period is not high enough for an initiative like this, if we take into consideration the progressive enrichment of the site with additional services and the corresponding gain in publicity (Gouscos and Staiou 2010). Since mid-2011, there has been an important decline raising concerns about the usability of OpenGov, as it clearly did not succeed to continue capturing the interest of the Greek population. This decline is associated with a decrease in the governmental posting of online consultations and open calls for recruitment (Fig. 1).

Table 2 Use of OpenGov.gr services since its launch (2009–2012). (Source: opengov.gr website (latest publicly available statistics))

Element	Time period	Number
Unique visitors	Oct. 2009–Dec. 2011 (27 months)	>4,600,000
Comments on consultations	Oct. 2009–Feb. 2012 (29 months)	>76,000
Applications for the recruitment of public administration officials	Oct. 2009–Feb. 2012 (29 months)	Approx. 130,000

In total, according to the data available, some 230 consultations, 76,000 comments and >4,600,000 visits have been registered as presented in Table 2. Despite the relevant high number of unique visitors for the first period until 2011, the participation of the citizens through the comments and the applications was not that high so we can assume that the fact of visiting the service was not enough to convince them to engage and participate. We must note here that every citizen had the right to submit up to five applications for the recruitment of officials, so the real number of unique citizens that visited the site may be quite smaller.

5 Electronic Consultations

Electronic consultation is a two-way relationship between citizens and government, providing an online feedback mechanism from public authorities to citizens (OECD 2003).

In the Opengov.gr, the majority of draft legislation pieces are posted in the platform prior to their submission to parliament, and the citizens and the organizations who are interested can post their comments, their proposals, even their criticisms article-by-article. The consultations are classified by ministries, so citizens can find the one they want. The form chosen for this platform was a website of Open Source Code (WordPress) where draft legislations as text documents are published and are open to simple serial commenting paragraph-by-paragraph by anyone with a simple name and email registration (Goulandris 2010). We could argue that this is a quasi-identification procedure that neither falls into a full-identification procedure of the participants nor allows for total anonymity. The structure and the format of the website are not tiring for the user, and anyone with basic Internet literacy can use it. However, a great disadvantage is that the site does not have a word or phrase search engine for rapid access to specific topics and data (Deligiaouri 2010).

The procedure which is followed has four phases: The first phase is the preparation of the consultation and the approval from the office of the prime minister. In the second phase, the consultation is posted in the platform and is available for comments, although there is moderation by the partners. Citizens can post their comments and like or dislike other citizens' comments. The third phase is the editing of the conclusions when the ministry in charge processes the comments and creates a

Table 3 Most active ministries on consultations and the number of comments they received (2009–2012). (Source: opengov.gr website (latest publicly available statistics))

Ministry	Number of consultations	Number of comments (approx.)	Average number of comments per consultation (approx.)
Ministry of Interior, Decentralization and e-Government	11	14,300	1,300
Ministry of Finance	10	18,700	1,870
Ministry for Development, Competitiveness and Shipping	32	4,500	140
Ministry of Environment, Energy and Climate Change	46	10,100	220
Ministry of Education, Lifelong Learning and Religious Affairs	23	10,500	460

draft report. The fourth and final phase is the posting of the voted law and the report on the results of the consultation.

Probably, the most evident observation is that some ministries' deliberations are more popular than others, concentrating most of the comments. Clearly, these results are influenced by the current sociopolitical situation of the Greek society that reacts to financial and structural reforms that are currently under implementation in areas such as urbanism, education, enterprises and others. As seen in Table 3, the Ministry of Interior and the Ministry of Finance are the most "popular", probably due to the issues that they cover.

The procedures of OpenGov.gr online consultations can reveal some eventual gaps and inconsistencies. As Deligiaouri (2010) explains: The rules and terms that govern deliberations need to be reconsidered along with the way personal details of any of the participants are checked for their validity and correspondence to true identities. Furthermore, as Goulandris (2010) mentions, what seems to be missing is a holistic approach of what policymakers expect from the deliberation and how they plan to use citizens' feedback.

6 The Role of Media

Concerning the role of media, the OpenGov.gr initiative has been met with suspicion as a possible "crude legitimization for the traditional practice of political patronage". Generally speaking, mistrust was aired in public and in the traditional media about the objectivity of the selection process, implying that no policy of meritocracy was actually followed in employment (Deligiaouri 2010). In Table 4, we can see how traditional online Greek media have reacted to the OpenGov.gr initiative since 2009 in terms of online references.

In its early days, the OpenGov.gr initiative did not achieve a great amount of publicity. Still, as the content was being enhanced, media references increased as well, and a big difference in available statistics can be observed between the first

Table 4 Online references (approx.) for OpenGov.gr (2009 onwards). (Source: google.gr, search on the web and blogs with keyword “opengov.gr”, excluding site: opengov.gr, excluding pages not in Greek)

Online references	2009	2010	2011	2012–2013	Total 2009 onwards
Blogs (in Greek)	500	1,800	7,200	6,200	15,700
General sites (in Greek)	12,500	44,700	114,000	42,000	213,200
Total	13,000	46,500	121,200	48,200	228,900

and last years of reference. The peak was reached in 2011, probably due to public activity of reorganization of the public sector (intensive legislative activity). Media references were both positive and negative, and concerned the same pros and cons of this 3-year-experience that our analysis has highlighted.

7 The Value of OpenGov.gr as a Sustainable eParticipation Model

Open government is seen as a government strategy which includes citizen participation in the process of political decision-making, and allows open access to public data to enhance transparency and to assist policy-making processes. Clearly, it is the ideal landscape for eParticipation mechanisms to flourish so as to further the democratic process of representation (Hacker and Van Dijk 2000). The question is if and how we can institutionalize eParticipation via OpenGov practices as it contributes to enhance the sense of collaboration.

The fact that for the first time in Greece, government opens up to the public and asks for its opinion and participation so as to invest on its knowledge and experience for strengthening the policy-making procedure, together with the fact that this service is available for only 4 years, makes evaluation challenging. As shown by the number and quality of the comments made, together with the number of visitors, there is an interest from the public to participate and follow up the procedures.

In this way, the OpenGov.gr initiative has become an umbrella for a number of activities and efforts to increase public participation through more open policy development, in an effort to start addressing the numerous flaws that already exist in the Greek political system, while at the same time helping to move towards more collaborative models of governance. The initiative also encourages agencies to involve the public in generating ideas for improving government and policy. Although there is tremendous potential, the progress that has already been achieved towards the goals of making government more participatory and collaborative is not as high as one would expect. This is the case not only for Greece but for most of the EU countries and the USA; eParticipation in practice can still be characterized as an “experimental” or “pilot” approach that, although deployed by a wide range of institutions and decision-making processes, presents a divergent set of methods and philosophies within government organizations and misses a visible mass engagement of citizens (Kloby and D’Agostino 2012; Tambouris and Macintosh 2009; Sæbø

et al. 2008). For the EU, in particular, this problematic situation is often attributed to the absence of coherent policies across institutions (Chrissafis and Rohen 2010).

While the OpenGov.gr experiment with open policy dialogue is exciting and promising, future efforts need to build on what has been learnt thus far. The OpenGov.gr effort needs to find better ways to recruit participants, move from input to partnership and embed continuous collaboration with the government. Moreover, to guard against bias through any single form of public involvement, it is critical to combine online with face-to-face means of collaborative governance. Another area where there is room for improvement is in the quality of participation. Some commentators have criticized the initial results as masses of less-than-useful text. Using a platform with appropriate functionality, a moderation feature enables users to police their own community, setting clearer expectations and providing briefing materials to give people context and keep them on task. Giving users credit for their contributions may also create an incentive for higher-quality suggestions.

Apart from the main problems that the OpenGov.gr effort has encountered, which was the well-known fact that technology itself cannot fix problems persistent for many years now without active help from society, Greece is a country with relatively low Internet penetration (53.0%, when in Europe the average is 63.2% (Internet World Statistics 2013). This digital divide is even wider between men and women and between different age groups (Pateli 2010). Greece is currently ranked 39th out of 190 countries listed in the UN e-government development index, and slightly above average in the area of eParticipation (United Nations 2012).

Despite the above-mentioned serious problem, the whole construction of the initiative has several flaws in the authentication of the user, the structure of the text, the support material and the time of each deliberation. In addition, anyone can have a different IP, so he/she can make more than one login and comment as a different user. Another problem is the number and quality of the comments. Perhaps, the number of the comments is satisfactory, but they are made mainly by one user. Do we need a citizens' deliberation or an expert deliberation? Also, it is a possibility that half of the comments are spam. Do we need a "click" deliberation or a quality one? And how can we secure the quality and the democratic nature of deliberation?

The crucial point in this initiative, though, remains unexplored, and it is the incorporation of public consultation results into the final legal text which is just a promise waiting to be fulfilled by the deputy minister of each deliberation. Yet, there are no real safeguards for the validity of the final results and the implementation of a public-representative policy (Deligiaouri 2010).

Greece is at a very critical moment of its history, and it is crucial for the government to have the support of the citizens, voters or not. This support can be obtained with trust. Trust can be built with accountability through open data and access to information, which is a fundamental right. The government has to be firm to its decision, to "use" the citizens' proposal when it is possible and to show them that their participation and effort are not virtual. Every new consultation gets great attention from the public, which is now informed through other initiatives regarding the governmental data, something that shows the eagerness of the public body.

For success, there is a need for better advertisement several months before the consultation, , in order for the citizens and the experts to be prepared to participate.

Also, during the consultation, the procedure must be clarified with background documents (Goulandris 2010). But maybe the most important point is the change in the culture. Greece and all the countries that aim for eParticipation and eDeliberation, have to change their culture and educate their citizens as well as the public sector to participate. Until now, Greece had focused on making the government more open to fight corruption and improve accountability. The next step is to follow the paradigm of countries with older tradition in openness, like Denmark, which are now trying to make the government more user-friendly, to improve service delivery and to make policy-making more inclusive (Yannopoulos 2010).

Being part of the international Open Government Partnership initiative, since 2012, the Greek Ministry of Interior has set two goals specific to electronic consultations for the year to come: increase the number of legislative acts going through online consultation and capitalize on citizen comments and suggestions (Greek Government 2010). Recognizing that currently online consultations are limited, the ministry targets to double the number (percentage) of legislative acts that will go through this process, as well as to increase the public engagement and the feedback received.

Furthermore, acknowledging that there is no predefined process of handling all the comments and suggestions of citizens/organizations, construction of audit trails through the process is foreseen, in order to explain what criteria were applied when weighing up the evidence from the process, and therefore, how the views of those involved in the participatory process have improved the results.

8 Concluding Remarks: Future Work

The OpenGov.gr initiative can be considered as a positive step towards a new era of politics and public affairs administration introducing eParticipation mechanisms as a means to enhance the citizen–policymaker relationship.

However, we should not expect this open government experiment to be a panacea for overcoming the pitfalls that the Greek representative democracy has fallen into. Empirical studies demonstrate that it is more likely for the Internet to facilitate active citizens' engagement in politics than to motivate passive citizens (Weber et al. 2003).

The Internet is not a political medium per se, but it can be used to enhance and upgrade the relation between governments and the governed if we take technology under democratic control (Shulman et al. 2003) and explore the potential for citizens' active civic engagement by eliminating their disbelief in the real value of their contribution. Socioeconomic variables govern the level and quality of both OpenGov and eParticipation governmental efforts for putting political decisions to public scrutiny, and need to be considered along with the appropriate processes (DiMaio 2010).

Educational issues, motivational reasons and specific political conditions are likely to affect the anticipated citizens' "input". It is only with suitable policies and institutional support that governments could capitalize on some of the emancipator

potential of the Internet and democracy could be reinvigorated. For the moment, new expectations and meanings for citizenship are entertained and governments, the Greek government in our case, have a great difficulty to respond satisfactorily to the new needs and problems of society (Coleman and Blumler 2009).

Additionally, the majority of what is said on the Web is not deliberative but could nevertheless have political effect (Dahlberg 2007). Thus, as Jouët (2009) points out, new modes of civic expression have appeared, characterized by a mix of private conversation and public speeches and discourses, which combine all the multimedia resources of the Web, i.e. textual, sound and video content. This new ecology of words can be seen in multiple spaces or in both static and dynamic online instruments where the public nature (in the sense of what concerns the general interest) of a discourse is no longer indexed on its visibility, and vice versa. Nevertheless, there is still the main problem of the disconnection between the informal public sphere, supported by activists, and the decisions that are actually taken by the legislative body, administrative agencies and/or political authorities.

A major direction of future research, in this respect, needs to be directed to the qualitative and quantitative benchmarking effort concerning OpenGov.gr that seems to be missing from both governmental and academic ends. In order to improve its efficiency as a sustainable eParticipation mechanism, it is essential to have a retrospective insight into its actual use and its effectiveness. As far as the electronic consultations are concerned, there is a need for a better understanding not only of users' satisfaction but of how OpenGov.gr is affecting the organization and the functioning of the legislative process and of the organizational changes that it has or needs to engender.

Apart from that, and in the absence of a widely accepted standard definition of effectiveness in eParticipation, the evaluation must accommodate a variety of subjective assessments of the many actors involved, and of the many constituent elements of OpenGov.gr in order to identify the impact that the electronic consultations actually have on the final legislative decisions adopted.

In this line of thought, a number of aspects such as commitment by the government, usability, combination of online with offline communication channels, security and privacy, organizational changes, complexity and quality of participation need to be in the heart of the research agenda on assessing the outcomes of the operation of the OpenGov.gr platform. Important outcomes that need to be assessed in this way include increasing the level of participation, including new societal groups in it, identifying concrete effects on the decision-making process as well as impacts on citizens' trust in government.

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Open Government in the Basque Country

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1 Introduction

The Basque Country is a small region in Spain with a population of 2.1 million people. Nevertheless, this region was one of the first societies to start up an open-government strategy in 2009, launching projects guided by the principles of transparency, participation, collaboration (Ortiz de Zárate and De los Rios 2013, p. 98).

This chapter aims to approach the Basque open-government policy from several perspectives. First, from an analytical perspective trying to understand the political and organizational implications involved in open-government policy. Second, from a practical perspective with the participation of two people who participated in these projects. And finally, from a citizen point of view, to assess to what extent the open-government initiative in the Basque Country has involved citizens.

This chapter starts with a contextualization of the open-government policy, considering the main issues (leadership, wills) which led to the openness. Secondly, the chapter describes the most significant initiatives that the Basque Country has undertaken to develop its model of open government, showing its strengths and weaknesses. The final discussion reflects on the progress made and to-dos.

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2 Contextualizing Open Government in the Basque Country

The concept of “open government” is not a new one (Yu and Robinson 2012, p. 59). It was first mentioned in the 1950s (Parks 1957). And it was used in the USA and the UK in the 1960s and 1970s to feature the right of citizens to access public information and the duty of public institutions to provide this information to the citizens (what today might be called transparency) (Nader 1974). Interestingly, “open government” was also the name of the first episode of the BBC comedy series “Yes Minister,” broadcasted in 1980s¹.

The advent of the Internet indeed opened up new opportunities to recover principles and values that administrations had been asked to provide since the end of the twentieth century: reinvent, be receptive, or put citizens at the center of public policy (OECD 1987; Osborne and Gaebler 1992; Schachter 1995).

“Open government’s” definition is an open and permanent proposal to build governance models. These new models of governance aim to be structured alongside transparently informing, listening, talking, and working with civil society to deal with social needs effectively, efficiently, and sustainably (Gavelin et al. 2009; Lathrop and Ruma 2010, pp. 92–93; OECD 2010).

Open-government models also are proposed to promote more effective decision-making processes, avoid corruption, improve accountability mechanisms, and regain public trust in government and public administrations (Gavelin et al. 2009, p. 14).

To contextualize open-government policy in the Basque Country, first of all, we try to understand political, public, and organizational changes in the way people work and interact with citizens. Secondly, we consider the role of the people working in the public administrations to implement the modernization projects of the government.

Paradigm Shift: From Closing to Opening

Towards the end of the twentieth century, the Internet presence of public institutions in general, and of the Basque government, in particular, was limited to static display information, containing more propaganda than practical information about public activities, their purposes, or achievements.

Right now, the trend is to provide users with information and services in a simplified and proactive way. Hence, transparency is one of the basic principles for open-government initiatives: Without access to information in an accessible and understandable way, it is difficult to move towards citizens and civil society involved in political and public activity.

During the ninth legislature of the Basque government (2009–2012) the new administration launched a relevant change in communications and working strategy

¹ [http://en.wikipedia.org/wiki/Open_Government_\(Yes_Minister\)](http://en.wikipedia.org/wiki/Open_Government_(Yes_Minister)).

both inwards and outwards of the Basque government. Before describing the Basque model of open government, we make a special mention to the people who launched these initiatives, projects, and programs, joining wills and changing their mindsets, values and ways of working, etc.

Sum of Wills: Serving Citizens

Several circumstances had to be in place for the launch of open-government policy and its various projects and activities:

- *Political leadership* at the highest level embodied by Patxi López, president of the Basque government (*Lehendakari*)
- The will to provide a structure, economic resources, and a specific team working in these projects (*Office of open government*, located in the presidency of the Basque government)
- The will of *management and technical staff* to incorporate the open-government principles of transparency, collaboration, and participation in their performance values
- And the will of the *people, civil society, and businesses* to take part in this new way of governance not “for” the citizens (with final products and services created without users opinion), but “together with” the citizens and multiple agents to take part in the policies and services making processes.

Training of the Basque administration staff was crucial. Through various training programs, civil servants were encouraged to assimilate into their daily work processes, new ways to network, to provide services, or interact with users using new channels. Undoubtedly, this new way of governing with citizens involves important organizational changes, procedures, and working methods.

Some actions to open internal participation in public administration were: innovative workshop open to all staff, practice communities for gathering professionals around an area of knowledge, blogs and other social tools for internal use (Ortiz de Zárate and De los Ríos 2013, p. 100).

These are deep changes that cannot be addressed in one single legislature. Changes have to start inside the mind of politicians and civil servants: They have to research and consider what citizens, civil society, and the private sector expects from public administrations.

The Basque government made a special effort to value the ideas and contributions of several civil servants who were involved and supporters of different open-government projects. Two civil servants were recognized for their reflections on innovation in public administration and interaction with citizens, in a collaborative blog, as early as 2005. The blog is called “*Administraciones en red*,”² which can be translated as “Networked Administrations,” this means, public administrations working together.

² <http://eadminblog.net>.

These civil servants were proposed to manage the area of modernization and the area of the Citizens Advice service. The reasons given for this political decision were that as technical members of staff, they knew well these working areas; and because in their blog, over the years these two civil servants and bloggers had expressed interesting ideas about how to transform public administrations (Ortiz de Zárate 2009).

It is remarkable that their collaborative reflection on the role the government should play with the development of an open government: Linked Useful Democratic Open government (LUDO) model is a way to understand and classify the institutional initiatives of transparency, participation, and collaboration, in conjunction with the public policy cycle and the degree of openness (Ortiz de Zárate 2012).

3 Open-Government Model of the Basque Country

The Basque model has the particularity that it attempts to implement a comprehensive system of open government, unlike other initiatives that are limited to sectorial approaches. Therefore, it builds relationship spaces on the three principles defined by the open-government initiative of Barack Obama: transparency, participation, and collaboration (White House 2009a, b). The Basque model was designed in order to be used in the whole sphere of action of the Basque government, serving both the mainstreaming policies and the sectorial ones. The following pages describe the main projects in the Basque open-government model.

IREKIA

The prime minister's office ("*Lehendakaritza*" in Basque), through the office for open government and communication on Internet, launched in January 2010 the project called *IREKIA*³ (which means "open" in Basque). Its most visible dimension is a portal that supports institutional information, communication of governmental actions, conversation between citizens and public officials to present and discuss proposals, and the cooperation of citizens in the policy-making processes. IREKIA also functions as a brand identifying the set of other Basque open-government initiatives.

The IREKIA project is based on the same three principles of open-government model of Barack Obama (White House 2009a; IREKIA 2012; Ortiz de Zárate and De los Ríos 2013):

- **Transparency.** The government will provide members of the public with real-time information and data on its activities, plans, and intentions. The information, all the information, and nothing but the true information.

³ <http://www.irekia.euskadi.net>.

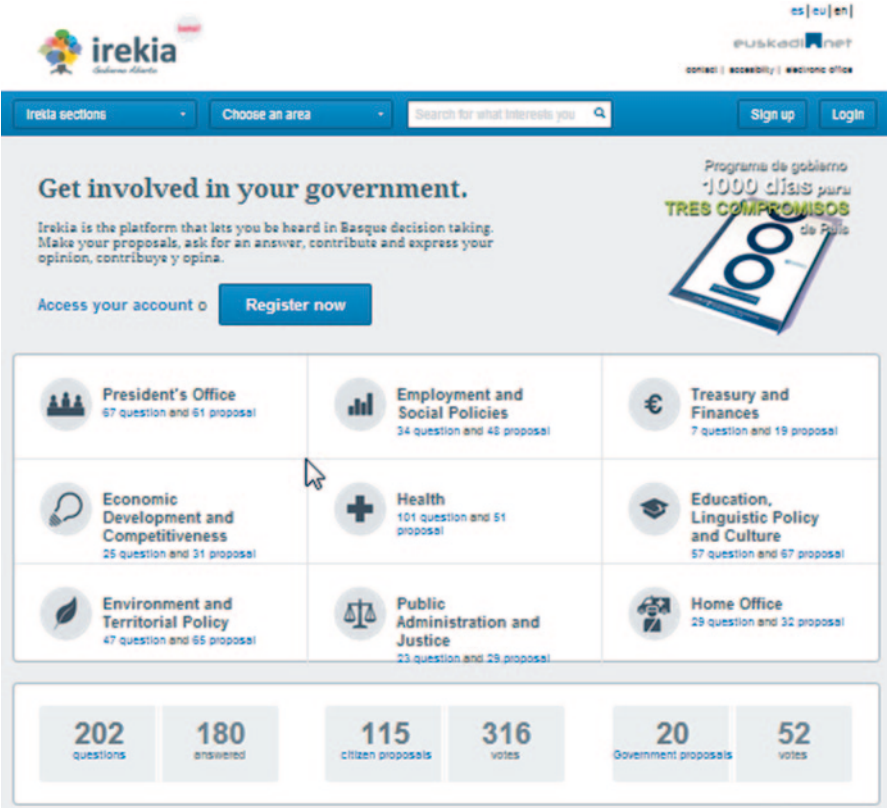


Fig. 1 General view of the portal. IREKIA’s intention is to expose to citizens, even before approval, governmental activity and consider citizens’ participation in their development

- **Participation.** All laws, decrees, measures, and other kinds of decisions taken by the government can be debated, assessed, criticized, and modified (even before they are drawn up) with the opinions of its citizens. Contributions may be made to measures promoted by the government but the public will also be able to make their own proposals which can also be discussed and analyzed by everyone. Participation not only on the government’s platform, but all around the Internet.
- **Collaboration.** The Basque government wishes to collaborate with its citizens, companies, NGOs, and other Basque administrations, providing all of them with innovative tools and new methods of working in collaboration. The government will listen to them and work together with them to build a better-connected society. Jointly building public well-being and taking care of the common people (Fig. 1).



Fig. 2 IREKIA's portal contains all official profiles in social media of the Basque government and its entities

IREKIA's vocation is integrating transparency and citizen participation in the daily practice of government action. This means that public information, that was previously fenced off for citizens, becomes open. For example: the legislative calendar or significant plans and actions foreseen in the horizon of the legislature.

An example of planning and evaluation of public policies from a governance perspective, considering multiple stakeholders in the policy-making process can be the preparation of the draft law on transparency and good government sponsored by the directorate of coordination of the Basque government. In this process, citizens were encouraged to participate in the preparation of the draft, making comments, and contributions to the previously written text.

Throughout IREKIA, the aim is to let citizens take some degree of control over public actions, and take part in decision-making processes, in order to feel part of the governance in the Basque Country public policies and services. The ultimate goal is enabling the original idea of democracy: governing with citizens. Thus, an important cultural change happens, when each citizen is no longer a passive agent who receives messages, but an active agent who takes part in political decisions that affect the community and proposes alternatives in an effective, easy, and continuous way (Fig. 2).

To encourage the discussion with citizens to facilitate the dissemination of information generated in IREKIA through its users and to carry out "active listening," profiles on the major social networks were created. Twitter, Facebook, Google+, LinkedIn, YouTube, Slideshare, Flickr, Pinterest, etc., are virtual places where citizens share contents and interact naturally.

In order to follow a standard pattern, a style, and usage guide for the Basque government's social networks was elaborated. It was created reusing and improving

another guide edited by the government of Catalonia with creative commons license (Basque government 2012b). And civil servants received courses so as to use social networks in the Basque government.

Open Data Euskadi

Basque government administration was the first non-Anglo Saxon one to implement a policy of open data, which began with an institutional commitment in December 2009 that materialized in April 2010 on the site *open data euskadi*⁴ (Zubero et al. 2012, p. 165). The mission of open-data's service is releasing public information, in actionable data so that other agents can reuse and create new services and value-added products for government, business, and society in general.

Open data euskadi is a transversal service involving the whole Basque government. This portal provides a blueprint to the release of open-data policy, encouraging reuse. And besides their data catalog, it offers content about what "open data" is and how to reuse it. It also answers FAQs. Finally, it provides technical information for re-users or *infomediaries* (Fig. 3).

Currently, the website of open data euskadi⁵ collects 29 examples using real data that various companies or agencies have developed. Among them, we highlight the project to visualize Basque government budgets⁶ in a more visual and dynamic view. This new visualization lets us see, in a very didactic way, how public money is invested and distributed.

Public Innovation Plan

The Basque government launched in 2011 the *public innovation plan* (PiP⁷, Basque government 2011; Basque government 2012a), a transversal plan, whose main challenges were:

- Making *electronic public services available* to citizens and enterprises, so that they can carry out all procedures through the Internet
- Promoting the *digital inclusion* of citizens, so that each person can have equal access to electronic public services
- Promoting *organizational change*, moving towards more collaborative and networked public administrations
- Bolstering *open-government principles in public management*: transparency, participation, and collaboration

⁴ <http://opendata.euskadi.net>.

⁵ <http://bit.ly/YnLv5f>.

⁶ <http://aurrekontuak.irekia.euskadi.net>.

⁷ <http://pip.blog.euskadi.net>.



Fig. 3 Open data euskadi portal acts as an aggregator of data sets released by the various Basque public administrations

- Moving towards *innovative management* that continuously improves the quality of services and systematically evaluates public policies
- Providing *modern and efficient* information systems, technology, and telecommunications services

Among the contributions of the PiP to Basque open-government model, for the design, the implementation, and monitoring, the plan launched:

- *Fifteen thematic working groups* with participation of many professionals who contributed with their knowledge, experiences, and points of view so as to elaborate the PiP: Professionals and civil servants of all the Basque government departments and other administrations, representatives of business and labor organizations, experts from universities or foundations, and other professional from different spheres of the Basque society
- *Seven communities of practice and three innovation teams and several collaborative networks* to build an innovative organizational model based on people and their knowledge
- A *blog*⁸ to inform and discuss the project plan
- A *group in LinkedIn*, open to any information or professional who wished to participate in the discussion. This channel ensured the acquisition of input from relevant professionals' profiles on Twitter⁹ and Facebook¹⁰ for those who want to follow the activity of the PiP

⁸ <http://pip.blog.euskadi.net>.

⁹ <https://twitter.com/pipejgv>.

¹⁰ <https://www.facebook.com/pipejgv>.

- A *video channel on YouTube*¹¹ to interview people who participated in PiP, and to share other interesting videos
- A *profile on SlideShare*¹² to share presentations related with PiP with agility

Perhaps, the main novelty of PiP, rather than its own content, was its new way to work: open and networked. Regarding the results, the implementation of PiP helped in the consolidation of citizens' information services, management of the Basque government presence on the Internet, the publication of services charts, and the improvement indicators of transparency and performance.

As an example, *Transparency Portal*¹³ provides access to relevant information and adopts the INCAU indicators system (Transparency Index of the Autonomous Communities), which is assessed biennially. In the 2012 evaluation, the Basque Country reached the top in ranking of transparency among autonomous communities, with a score of 97.5 on 100 (Transparencia I. E 2012).

Some challenges for the future in public innovation are:

- Promoting massive and widespread use of electronic services
- Strengthening and enhancing collaborative networks
- Moving towards management models which promote confidence and autonomy
- Enabling environments where information and knowledge flow easily and are indeed shared.

There is a very interesting opportunity to push these new actions in order to construct an innovative public-management model, not only agile and efficient, but also, open and networked, capable of properly meeting the needs and demands of our complex society of twenty-first century.

4 Strengths and Challenges

We would like to highlight the following as strengths of the Basque open-government model.

1. The presence of *political and technical leadership* at the highest level: Basque government's presidency assigned budget and human resources to the various projects of open government.
2. The willingness of Basque government *to be transparent*. And its accountability efforts for all laws, intentions, plans, regulations, decrees, and special performances, as well as events in which it has some kind of involvement.
3. The presence of public managers, civil servants, private and third sector professionals who believed that *there are other ways*, channels, and means *to develop public policies and services for (and with) citizens*.

¹¹ <http://www.youtube.com/pipejgv>.

¹² <http://www.slideshare.net/pipejgv>.

¹³ <http://www.gardena.irekia.euskadi.net>.

4. The *existence of technology* enabling that information, communication, collaboration, and participation can take place through more agile channels, thus leading to greater feedback from all stakeholders who can help to improve public policies and services.
5. The *knowledge and effective use of collaborative tools and social media*, such as blogs, wikis, or social networks, *by people leading and working on public projects* are key to using new channels to inform and interact in a more humane and less bureaucratic way with citizens.
6. IREKIA platform is available for citizens on its website and on social media. Thus, *every day it is reported what happens* in different departments, programs, and agencies of the Basque government. And, in addition, citizens' requests are received and processed. This allows *active listening* to better align the design of legislation, policies, programs, and public services to the real needs of society.
7. IREKIA's software is *open source* and it is available to other governments which want to use and adapt it to their needs (IREKIA 2011).
8. IREKIA¹⁴ and open data euskadi¹⁵ received several prizes and are recognized as *best practices*. And they allowed the Basque government to be accepted as a member of the World-Wide Web Consortium (W3C)¹⁶, the main international standards organization for the World-Wide Web. Given this membership, the Basque government can participate in the design of new tools and standards for the web.
9. By following the above, *citizens have more options* to get relevant information, to voice their opinion, and to propose alternatives of action and to evaluate public policies and public services.

Among the challenges for the future, the following need to be considered:

1. IREKIA is a *global and cross-cutting policy*, which is addressing change management towards open government (Ortiz de Zárate and De los Ríos 2013, p. 101). The open-government policy of the Basque Country has to expand to state and European initiatives. And it is necessary that other levels of government in the Basque Country (provincial councils of Alava, Bizkaia, and Gipuzkoa) and Basque municipalities also incorporate the principles and practices of open government, in order to generate synergies among stakeholders and solve social problems with a model of governance in policy making.
2. It is essential that professionals leading open-government projects or participative processes *believe in the principles and values* of open government. Otherwise, there may be a lot of resistance by keeping control over the information, not having more work, not wanting to learn to use new tools, not knowing what to communicate to citizens.

¹⁴ IREKIA received in 2010 Focus Awards for free knowledge as the best "Application of the principles of free knowledge to the manner of governing." <http://bit.ly/18xOxvl>.

¹⁵ Open data euskadi received FICOD Award 2010, as "Best citizens services project." Editor's Choice in ePractice platform 2011. Buber Saria 2012 for the best initiative to promote FOSS. CNIS 2013: Best project on data and transparency in Spain. <http://bit.ly/13aJfRF>.

¹⁶ http://en.wikipedia.org/wiki/World_Wide_Web_Consortium.

3. Beyond the need of the political and technical will to incorporate citizens' participation in the political process, it is necessary to carry out *new governance and citizens' participation models*. Consequently political and organizational transformation is required (Ortiz 2010; Ramilo 2010).
4. To create an effective participation process is not enough creating an innovative participatory infrastructure, and wait for citizens to take part. It is essential to maintain, at the same time, a *proactive attitude* in both face-to-face and virtual places where citizens and civil society interact and participate.
5. It is essential to *empower citizens* to be aware that it is a right and an obligation to participate and influence in political decision and policy making. If citizens and civil society do not want to participate, they would not, despite the design of innovative web platforms and services.
6. The open-government model in the Basque Country fails to reach those sectors of citizens and civil society that are not connected to the Internet. There are many people with no interest in using Internet, let alone, to know what their public institutions are doing. It is important to avoid gaps in the access to public information. And *citizens' participation can be channelled through different ways*: participation in person, by telephone, as well as through Internet.
7. Basque society, similarly to Mediterranean societies, tends to identify the family as a source of welfare. This fact generates more social cohesion than in other areas, but also public institutions and their activities are perceived as an external, alien entity. This perception challenges the implementation of the Basque open-government model, as *the model is seen as an initiative born at the top of the government* in which citizens, at the bottom level, do not feel it as their own. And this hampers its applicability, from the point of view of citizen participation and the co-responsibility of citizens in political and public affairs (Zubero et al. 2012, p. 66).

5 Final Discussion

Moving forward, it is important to extend this philosophy of opening, transparency, participation, and collaboration into everyday practices, such as cross-cutting principles as a new way of doing politics and public policies in the twenty-first century.

New political profiles and public sector professionals are needed. Governments and public administrations need open, relational, and honest people, focused on servicing citizens and their needs.

At a time of budget cuts and permanent changes, it is more important than ever to value the role of governments and public administrations. They are institutions with people elected by citizens and civil servants who have to work and coordinate with other departments and other governmental levels, so as to respond effectively and efficiently to the social needs. We need to have networked people and networked governments to solve our complex problems.

We must recover the value of the public and common goods. Open-government's initiatives can be interesting strategies to do so, if their attention focuses on restoring citizens' confidence and responsibility in policy-making processes and public goods management, and not only on the means to achieve it (i.e., tools and technologies used).

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Design and Implementation of Open-Government Initiatives at the Sub-National Level: Lessons from Italian Cases

Benedetta Trivellato, Roberto Boselli and Dario Cavenago

1 Introduction

The term ‘open government’ in its current use is normally associated with the memorandum on transparency and open government signed by the US President Barack Obama in January 2009, and more specifically with the open-government directive issued on December 8, 2009, requiring federal agencies to take immediate steps to achieve specific results in *transparency*, *participation*, and *collaboration*.

The concept of ‘openness’ is therefore linked to public institutions’ ability to redefine interactions with citizens and local communities, with the support of information and communication technologies (ICTs) and new digital instruments. An open model characterizes those public institutions at the national and local level which discuss and collaborate with citizens, and adopt open and transparent communication towards the local community. Decision-making processes in this perspective focus on the real needs of local communities. In this context, ICTs *enable* open government to the extent that they support and sustain the transformation of models, instruments and technologies within public administrations.

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Hence, the term open government can be applied to a variety of initiatives, with various levels of citizens' engagement supported and enabled by the ICTs. Relevant research questions in this perspective include the following:

1. To what extent and how are citizens and other stakeholders involved in local planning or decision-making processes? How is information on their needs collected and processed? How do ICTs support or facilitate such activities?
2. Which innovative ways are used to categorise and collect information and data to support policymaking? How does the use of open versus non-open data influence opportunities for participation?
3. Which difficulties and challenges—especially in relation to collaboration among key actors and systems—are likely to arise during the design and, particularly, the implementation of open-government initiatives? How can such difficulties be addressed?

These questions are explored through the analysis of the design and implementation processes of four cases drawn from the Italian context. All four refer to initiatives launched at different administrative levels (municipal, provincial, and regional level) in the northern regions of Lombardy and Piedmont, which to varying degrees try to take on and accomplish the principles of transparency, participation, and collaboration. The aim of these case studies' description and analysis is to provide a comprehensive picture of their objectives—as they relate to open-government principles—and the instruments which were employed to pursue them, and of the difficulties which arose especially during the implementation phase, as they relate to *information, technology, and processes*—and how they have been addressed—with the related implications.

The chapter is structured as follows: Sect. 2 presents the theoretical strands which build the framework for the description (Sect. 3) and subsequent analysis and discussion (Sect. 4) of the case studies. Lessons and conclusions are provided in Sect. 5.

2 Theoretical Strands

The concepts of transparency, participation, and collaboration promoted by the open-government approach are closely linked to the theory and the practice of *governance* as it has developed over the past two decades. In the meaning that is adopted here, 'governance' can be defined as 'the pattern or structure that emerges in a socio-political system as a 'common' result or outcome of the interacting intervention efforts of all involved actors. This pattern cannot be reduced to one actor or groups of actors in particular' (Kooiman 1993, p. 258).

The implication is that good governance cannot be achieved by good government alone, and rather requires cooperation among all the relevant stakeholders (Löffler 2009). Government is not the central actor anymore, but only one actor in the policy process (Scharpf 1978), though with a specific role and responsibilities.

As inter-organisational networks of governmental and societal actors gain importance, a key challenge for government is to enable them and foster new forms of cooperation (Rhodes 1997).

Hence, we witness a shift from a situation where the local administration directly provides solutions to problems (*government*), to a situation where solutions are reached through mobilisation of a variety of actors (*governance*) (Balducci 1999). This change is both the result of social and economic developments, such as the increasing role of private and non-profit organizations in the provision of welfare services, and of the effort to involve such nonpublic actors in policies' implementation in order to pursue benefits in terms of efficiency, responsiveness, choice, and equity (Le Grand and Bartlett 1993). Governance therefore differs from government not only as far as policy definition and planning is concerned, but also in services provision. The government-governance shift implies that more attention is given to the process rather than to institutions (Cavenago 2000, 2004).

Building on these ideas, Osborne (2006, 2010) developed the notion of new public governance (NPG) as a theory or regime that recognises the existence of a *plural state* (where multiple interdependent actors contribute to the delivery of public services) and a *pluralist state* (where multiple processes inform the policy-making system), and seeks to understand the development and implementation of public policy in this context. Rooted both in institutional and network theory (Ouchi 1979; Powell 1990; Powell and Di Maggio 1991; Nohria and Eccles 1992), NPG's focus is upon inter-organisational relationships and the governance of processes, and it stresses service effectiveness and outcomes.

Governance and Public Engagement

As Löffler (2009, p. 219) points out, 'the move from government to governance requires all stakeholders to play a much more imaginative role in shaping the decisions in their communities or policy networks.' This highlights the role of different stakeholders, including the public sector, in solving different problems in society. Key stakeholders in public governance issues usually include: citizens (as individuals), community organisations, non-profit organisations, business, media, public agencies at different levels of government, elected politicians, trade unions. Those who are most important for any given issue will vary, depending on the policy area, the geographic area, or the community concerned.

Public engagement at different levels of government has become popular in advanced democracies as a means to rebuild trust in government, and to ensure that services are more responsive to citizens' needs (Martin 2009). Other benefits include (OECD 2001): better public policy, as public engagement provides public administrations with a better basis for policymaking and services design and planning; greater trust in government which, by letting citizens' provide input into decision-making, strengthens government-citizen relations; and stronger democracy as a consequence of greater transparency and accountability.

The rapid growth in direct participation, as opposed to indirect participation through elected representatives, is reflected in the growth of participatory budgeting (Bassoli 2012) and various forms of participatory decision-making at the local level, including strategic urban planning (Cavenago and Trivellato 2010). In these cases, a governance approach is potentially more effective than traditional approaches because it allows to: gather and analyse a wider body of information; take into consideration a variety of different values and opinions; and ensure greater adaptability and flexibility (Scharpf 1993).

Forms of Public Engagement

Citizens' engagement may take the following forms (Martin 2009): (a) *information*, as a one-way flow from public agencies to the public, (b) *consultation*, as a two-way dialogue between public agencies and the public, and (c) *co-production*, as active involvement of the public in policy decisions and/or service design/delivery.

Information is the basis for greater involvement in policy decisions, as data about different variables are required depending on the context and the stakeholders involved. People need to be made aware of which services are offered, when, and where; at a higher level, information should also be provided about expected and current service standards, those achieved by different categories of providers, and the reasons for resource allocation and constraints operating on the services in any specific area (Martin 2009). This is especially important where services are offered both by public and private providers, as in quasi-markets (Le Grand and Bartlett 1993), and availability of accurate and independent information on services features, both on the demand and supply side becomes particularly important.

Consultation involves a two-way dialogue, and may imply different levels of engagement. For instance, citizens or specific categories of stakeholders may be presented with a range of options, and asked to indicate their preferred one through a voting system; in other cases people are consulted at a very early stage and may be given the chance to shape the decision-making process and play a role in conducting the consultation exercise. Often however, citizens are consulted at a late stage in the decision making process, when key decisions have already been taken. Occasionally public agencies may not be ready to provide feedback to citizens in relation to their contribution, or consultations are conducted by staff at the lower levels of the hierarchy or by external consultants, with the risk that their results do not reach the decision-makers (Martin 2009).

As for *co-production*, the term may be used to refer to different activities depending on the context and the subjects involved. Most definitions focus on services as the object of co-production. For Jakobsen (2013, p. 30), for instance, 'citizen coproduction is defined as citizens' participation in, and contribution of input to, the production of public services. The mixing of input from citizens and public employees can occur through coordinated efforts or indirectly through independent yet related efforts.' On the other hand, 'the concept of coproduction is not only relevant

to the service delivery phase of services management (where it was first discovered in the 1970s) but also can extend across the full value chain of service planning, design, commissioning, managing, delivering, monitoring, and evaluation activities' (Bovaird 2007, p. 847).

The distinction between three different forms of public engagement raises the question of which tools and practical approaches may be adopted in each case. As for information, tools include a variety of media often used by local and national governments such as service directories, videos, road shows. Consultation methods include traditional tools such as public meetings, service user forums, focus groups, visioning exercises, but also others such as opening of council meetings to local people, or free phone lines for citizens' comments and suggestions and complaints (Martin 2009). Lastly, co-production may rely on social media and collaborative software like wikis, social networks, and blogs (Boselli et al. 2008).

Risks of the Governance Approach and Obstacles to Effective Engagement

The governance approach is not without risks (Mele 2009): collusive behaviours may develop between local administrators and specific interest groups (Haufler 2003); public interest decisions may be left to the private sector without adequate consideration of all the relevant stakeholders, and some groups of citizens may be granted inequitable access to political representation (Mayntz 2003). Citizens' involvement also entails social and political costs, such as lengthening decision-making processes, the risk of excessive compromise, the ambiguity of some solutions in relation to some interest groups, and so on. The risk of institutional duplication should be avoided to the extent possible (Mele 2006). Moreover, increased public participation is often not seen favourably by public officials and politicians, because some see it as a threat to their professional judgement or democratic legitimacy. There is rarely only one correct method: public meetings and focus groups allow high interaction but reach only a small proportion of the population, are costly, time-consuming, and require skilled facilitation. Surveys of residents offer breadth of coverage and are cheaper, but provide less in-depth interaction. Many members of the public are even unwilling to engage, with the implication that the minority who gets involved is unlikely to be representative of the community as a whole (Martin 2009).

The Role of Open Data

The existing research and practice about open government focuses mainly on open data and collaborative public services. Open data are closely linked to the governance approach described above because, in principle, they are meant to allow and support transparency of processes and codesign of services. These, in turn, permit

smoother decision-making and higher citizens' involvement, both in the formulation and implementation of public policies.

The Obama's open-government directive establishes that 'agencies should publish information online in an open format that can be retrieved, downloaded, indexed, and searched by commonly used web search applications.'¹ One of the first effects of Obama's directive was the publication of open data by public agencies and administrations. Open Data can be defined as 'data freely used, reused, and redistributed by anyone subject only, at most, to the requirement to attribute and share alike'², and they are at the basis of the three open-government principles. Transparency is allowed as citizens can get to know and evaluate public administrations activities, while public administrations can also increase the value of their data catalogues, which otherwise remain hidden and unfruitful. Open data also promote the two other open-government principles, participation and collaboration, mainly with the support of Web 2.0 technologies (social media), by facilitating users in the creation, publishing and sharing of data and knowledge on the Web. Through participation and collaboration, various categories of public service stakeholders can access and use open data to design, produce, and develop new services, thereby contributing to the whole decision and policy-making processes. In order to support these activities, a set of fundamental guidelines has been defined to guide public administrations to publish their data in open format correctly. These guidelines concern both the technical and normative aspects: open data must be complete, primary, timely, accessible, machine processable, license-free, etc.

According to many experts, the liberation of public data is an important opportunity for public administrations to exploit all the potentialities and benefits of the ICTs and of the digitalisation of their data. Moreover, with open data, public administrations can overtake their closed boundaries of bureaucratic processes of data management, both inside and outside, also in relation with local communities.

Towards Public Services 2.0

Since the 1990s, the requirement for the public sector to be more modern, flexible, and effective has become increasingly strong. With the ICTs the public sector has found innovative ways to generate more effective government services, until the last generation of e-government services enriched through the social paradigm, the so called Government 2.0 (Eggers 2005).

Actually, public administrations need to invest in the design of new public services, following the revolutionary approach introduced by social media. An innovative social media-based type of public services was born, defined as *Public Service 2.0*, or *user-generated government* (Leadbeater and Cottam 2008). Recently, many institutions and communities proposed norms and guidelines to create a shared plan

¹ <http://www.whitehouse.gov/sites/default/files/microsites/ogi-directive.txt>.

² From Open Definition, v.1.1, url: <http://opendefinition.org/okd/>.

of action for the development of Public Services 2.0 (Osimo 2008, 2010). Increasingly, the importance and the usefulness of user-driven and highly personalized public services have become clear to public administrations. The design approach involves the introduction, in the whole service process, of higher user participation as well as public–private interaction. Public Services 2.0 appear as a new e-government service frontier based on the same principles of open government.

In fact, the first experiences of Public Services 2.0 are the federal websites of Obama’s administration, data.gov³, and the UK’s government portal⁴ providing open data to citizens. Subsequently, other experiences emerged with a bottom-up approach, such as websites where citizens evaluate and rate national health systems or the central government’s work⁵, or others providing information on the state of urban spaces or suggestions in the choice of schools for the children⁶. The concepts of transparency, participation, and collaboration with the social media allowed such a change by reducing the barriers which often characterise public administrations.

However, despite such variety of opportunities, there are problems of various kinds: the choice of data to be published and the related level of granularity; legal issues (privacy and licenses); technical issues, relating to which format should be used and how to publish; quality considerations (consistency, accuracy) (Boselli et al. 2013); the choice of the appropriate level of semantics (metadata, conceptual models, ontologies) and of reusability, and also the choice of linking—or not—different datasets by using semantic links (linked open data (Berners-Lee 2006)) and how to display them and make them searchable. In order to address these issues, methodologies and technological solutions are needed with the aim to innovate the whole cycle of data management, from the identification of which data should be used up to their dissemination.

3 A Selection of Italian Cases: Towards Open Government Implementation?

This section describes four case studies that, in different ways, try to accomplish the principles of transparency, participation, and collaboration. They are presented here in their design and implementation processes, so as to highlight the congruency of the choices that were taken, in terms of objectives, stakeholders’ engagement, and ICT supporting instruments and systems. Our objective is to point out the difficulties and resistances which arose especially during the implementation phase, as they relate to information, technology and processes, and how they have been addressed. The cases are presented following a time evolution, which also happens to reflect an evolution in the effectiveness of the choices that were made.

³ <http://www.data.gov/>.

⁴ www.data.gov.uk.

⁵ Such as www.patientopinion.org.uk and www.theyworkforyou.com.

⁶ Including www.fixmystreet.com and www.ratemyschool.net.

These specific cases were selected because they allow to show a path whereby resistances to implementation progressively diminish, due to the flexibility that is permitted by the use of open data, and the individuals involved learn to manage complexity. These cases therefore represent evolving examples of an open and active learning that goes beyond the conservative learning that is typical of public sector organisations. Moreover, the authors had the opportunity to participate⁷ in the design and implementation process of the systems that are described for each case, and to be involved in the related action learning process. The sources of information for the case studies therefore include direct participation, access to relevant published and unpublished data and reports, and interviews and focus groups with key actors involved. These case studies cannot be generalised to all Italian experiences, but they are representative of Italian public institutions of different sizes and belonging to different administrative levels. They are meant to provide examples of the challenges and obstacles which may arise during the design and implementation phases of open-government initiatives. Some of these challenges are linked to the institutional and regulatory environment and the cultural attitude which often characterises Italian public institutions, and may therefore arise also in other Italian—or possibly international—cases; other issues that are more organisational in nature may also arise in other national or local contexts.

Municipality of Milano: The ‘Services Plan’

This case is related to the urban-planning process carried out in the years 2008–2010 in the city of Milan, in northern Italy. In those years, Milan’s municipality was in the process of drafting its first so-called ‘services plan’ as part of a new local government plan requiring a wider and more strategic approach to local development, including citizens’ participation from the early stages of the process. The services plan in particular provides a picture of the current state of services that are both publicly and privately provided, evaluates the gap between supply and demand, and provides for the necessary changes.

Given these requirements, the municipal administration decided to experiment with innovative ways to detect citizens’ needs and classify the services which satisfy them, especially through the use of ICTs. In 2008, the administration therefore decided to involve an external, private design firm, in order to identify new means to detect and assess citizens’ demand and needs in relation to services. Against a reasonably good map of the services supplied by public agencies and institutions (e.g. schools, hospitals, parks, libraries, etc.), there was a lack of complete and homogenous information on the supply of private services, both for profit and non-profit, and as they relate to different needs (e.g. cinemas but also private providers of social services). A second problem was related to an evaluation of services’ de-

⁷ The authors are aware that direct involvement may cause the risk of a biased perspective. On the other hand, it is also a way to avoid conventional rhetoric, and observe actual practices of action and interaction which substantiate design and implementation processes.

mand which could take into account also citizens' needs (in addition to the assessments and projections done by the municipality's statistical office).

As a solution, the design firm undertook an analysis of each of the existing 88 districts (the so-called NIL or *nuclei di identità locale*, local identity units), where private services supply was identified and mapped in addition to the public supply. Three instruments were then used to detect citizens' needs: (a) meetings between the councillor responsible for local development (the so-called *Assessore*) with neighbourhood associations, (b) a media review carried out for 1 year on all print and web-based media referring to the city of Milan, (c) phone calls and emails received by the municipality's complaint office. The quantitative and qualitative information on services demand and supply for each NIL was then graphically represented on a map (by using Google Maps), so as to assess the gap between demand and supply and identify related opportunities and challenges. New projects by private developers were also mapped in the NILs where relevant, in order to connect them to local needs: instead of imposing the usual edification charges, the municipality had the chance to assess any unmet demand in that specific NIL and ask the private developer to provide an appropriate response. All this information was included and integrated in the actual services plan, a document consisting of several hundred pages with an introductory report and several annexes, including methodological explanations and one annex containing nine pages/record cards for each of the 88 NILs.

This approach was very innovative compared with Milan's tradition of urban planning, based essentially on the administrative and socio-demographic information that was already internally held and processed by the statistical department. A consistent effort was made to identify problems and needs explicitly and implicitly felt by the citizens, but also to highlight innovative solutions or ideas that had been put in place by the citizens themselves or by community organisations or by private providers, for instance in relation to local security or street cleaning. The results of such consultation, together with the complementary analysis and related assessment, were georeferenced and graphically represented in a very effective way, also thanks to the competences of the design firm which coordinated and directed the entire effort, and published on the municipality's website.

The main problem with this approach was that, despite a certain technology's use that was quite innovative and unusual for public administrations at the time, the entire process was carried out so as to be a one-time effort. The output was a series of documents in PDF format which could be downloaded from the municipality's website, but had no provision for constant updating. A second problem was more organisational in nature, and referred to difficulties encountered in the integration of contributions from different departments within Milan's municipality. The new approach to the local government plan required also a change in the way services were categorised and mapped within the administration itself, so that new requirements were placed on existing departments in terms of cooperation with each other and timely provision of information. While this problem was to some extent expected and unavoidable, it was addressed both through internal and external mechanisms. Internal mechanisms included a strong drive and motivation on the part of the coun-

cillor for local development and of some directors of the departments involved, who played a critical role as sponsors and facilitators, together with frequent meetings with both internal and external contributors to the services plan. As for the external mechanisms, several external subjects were involved in the entire planning exercise, in addition to the above-mentioned design firm: a private consultancy company in charge of programme management, experts from Milan's universities, and other professionals and city planners.

'Magenta Warehouse': A Data Warehouse to Support Policy-Making at the Sub-Provincial Level

The case refers to the establishment (2010–2011) of a data warehouse to support policy-making in the area of social services within the so-called 'area plan' (*Piano di Zona*). Based on the national Law 328/2000, and the Lombardy regional Law 3/2008, the plan represents a 3-year plan for the development of social policies to be pursued at the sub-provincial level. The geographical area corresponds to the 'district', a group of municipalities that is mostly smaller than a province, in this case centred around the municipality of Magenta (located in the Lombardy region, west of Milan). The objective of the data warehouse was to create an instrument to collect, analyse, and process data and information on local citizens and their families from the entire district, so as to use the related content in the definition of social policies and strategies, in addition to monitoring and prevention.

Relative to the past, the innovative approach consisted in an improved way to assess and analyse local needs, and relatedly the gap between demand and supply, through the integration of previously unused, non-open information sources, with the help of a purposefully designed data warehouse. The data warehouse was to replace the previous paper-based approach and the related report, and to become an instrument with the capability to be updated in real time. Relevant information could be provided both to internal users, such as employees of Magenta's municipality and of the other municipalities belonging to the district, as well as external users, such as local citizens and stakeholders, and the public at large. The planning phase started in 2009, when the availability of open data was still very limited or non-existent in most Italian localities. Supported by a research centre of the University of Milano-Bicocca (the Interuniversity Research Centre on Public Services: CRISP), the municipality of Magenta started to design a decision support system enriched by business intelligence functionalities, aimed at integrating different sources of administrative data for the 13 municipalities included in the district, so as to provide a better picture of the factors which could influence services' demand. The information sources were not publicly available, but were either among those that are commonly held by municipalities in Italy i.e. the registry, or could be provided by the relevant public agency: the Inland Revenue (*Agenzia delle Entrate*) for data on the incomes of local citizens' and their families, and the provincial government for labour market information (new hirings and expired contracts, and change of

employer) on those same citizens. These data could then be combined with the data on expenses for social services borne by the municipalities, so as to estimate⁸ individuals' and families' services consumption patterns and their possible evolution.

In the design phase, the main innovation of this approach was in the detection and assessment of citizens' needs, by using data and information (though 'non-open') with a specific focus on the information *flows*, ultimately aiming at a better understanding of citizens' needs and of services consumption patterns. For this picture to be constructed, the second stage required a mapping of social services' supply in the 13 municipalities covered by the area plan. A reclassification of services was proposed, so that services categories could be made homogeneous across the different municipalities; the latter were then asked to provide data on services' supply and suppliers.

In this phase, a few problems started to arise: no comprehensive and reliable information on the services provided by private, mostly non-profit, suppliers was available, as there was no complete mapping of the suppliers themselves. As for public suppliers, they could be identified and mapped, but with no adequate data on services use. In other words, providers do of course have data and information on the numbers and the characteristics of their customers, as well as on the services they provide to them, but these data are collected in a very diverse and nonhomogeneous way, so that there is no way to integrate them into a single information system. This meant that the services consumed by individuals and families could not be assessed. This exercise was possible only for healthcare services, where the responsibility for the system's coordination, financing, and management lies at the regional rather than the municipal level, and a different system for data collection and storage is in place. During the implementation phase an online platform was constructed as a tool to support policy-making by the municipalities involved (the platform was not, and is not, available to the general public). The platform included a number of useful features, including dashboards and maps, but its potential was not fully exploited due to the above-mentioned lack of adequate data on services provision and consumption, and because of organisational resistances by the municipalities who were to provide the data, as well as bureaucratic obstacles that were put forward during the effort to develop more advanced algorithms.

The main problem here, therefore, was not technological, but rather linked to the data collection systems, and the data themselves, being mostly nonhomogeneous. This was complemented by a general reluctance by many public administrators to provide the necessary data, citing (groundless) reasons of privacy or slowing down the process. Local managers in charge of policy-making and programme design were aware of the potentialities at the micro level, but at the political as well as administrative level many people did not understand how the data warehouse could become an instrument to support the constant and progressive construction of the

⁸ Data on services' consumers do exist (for instance the list and names of all the children attending a specific nursery) but they are collected and stored using various and diverse means, software programmes or even paper, so that no integrated and comprehensive dataset or data source is available. This explains the need to estimate services consumption information.

area plan. Ultimately, there were no sufficient incentives for inter-organisational cooperation.

Province of Monza and Brianza: The ‘Social Policies Observatory’

Similar to the previous case, this case study also refers to the establishment (2011–2012) of a data warehouse in the area of social services, with the aim to support policy-making, and also information sharing with the local community. Differently from the previous case, both the input data and the output information, together with the ICT instruments developed to search and analyse the data, are publicly available. The relevant administrative level here is the province of Monza and Brianza, located in Lombardy and bordering the province of Milan on its northern border. As in the previous case, at the outset the objective was to build a comprehensive picture of the supply of social services, to be matched with a system to assess demand. However, while in the previous case the process was initiated by Magenta’s municipal government, here the process was initiated by the provincial government, without first involving the municipalities which were to provide the data in the first place. A strong resistance was therefore put forward by the municipalities, and especially by that of Monza, which is the biggest town in the province. In fact, the provincial government underestimated the bureaucratic and political obstacles generated by different levels of territorial autonomy, thereby undermining the weak ties that characterise network systems.

In this context, the system’s implementation process was reversed relative to the case of Magenta, through an effort to map first the services supplied by private (non-profit) providers. Here the relevant data on the private providers and their supply were provided by the provincial government, and were to be integrated with data from the citizens’ registry, data on the labour market (new hirings and expired contracts) provided once again by the provincial government, and aggregate demographic data provided by ISTAT, the national statistics office. The whole information system was lacking the critical information on the public supply of services, but the problem was to some extent addressed when the Lombardy regional government started its own ‘open data’ programme, thereby making available (though at more aggregate levels) some categories of data that the municipal governments had not been willing to provide. This allowed the construction of a reasonably complete mapping of private and public social services providers in the province, but with no data and information on users nor on services flows.

The main problem in this case was that the initiative was taken by the provincial government, but the content referred to functions and responsibilities held at the municipal level. The municipalities involved did not appreciate this effort, and refused to provide the necessary data. However, a preliminary assessment of the number of visits to this portal shows the success of this innovative instrument, especially in the current context where Italian provinces are subject to institutional revision.

Piedmont Region: ‘I Numeri del Lavoro’, Open Data of the Regional Labour Market

The last case refers to an initiative implemented in the years 2012–2013 by the regional government of Piedmont, in northern Italy. This consist of a web-based portal (piemonte.crisp.unimib.it/dasPiemonte) providing data and analyses on a number of issues and dynamics that are related to the local labour market; these processed data and analyses are produced by using open data from several sources, with the possibility to download the raw data which is at the basis of the elaboration. The portal provides the following: (a) analysis on the main employment indicators provided by ISTAT (the national statistics office) and EUROSTAT, (b) data on labour market dynamics (on new hirings and expired contracts—these are the only data that are not publicly available), (c) data on firms’ dynamics as expressed by their natality and mortality rates, provided by Unioncamere (The Association of Italian Chambers of Commerce), (d) dynamics of the region’s exports and imports, provided by ISTAT, and (e) data on business crises as reflected by the resort to different types of welfare support provision, provided by INPS (The National Social Security and Welfare Institute). Data are available both in graphical and numerical form, providing information that may be useful from different perspectives, and therefore potentially beneficial to a variety of stakeholders: policymakers, employment services providers, analysts, businesses, and citizens. This is the first example in Italy of a portal which integrates these various sources of data all related to the labour market, which previously had to be collected from the individual sources.

The current configuration of the system is actually the evolution of something which at the beginning was meant to be a statistical information system (based mainly on the labour market information mentioned above) to support employment-related policy-making at the regional and provincial level. However, the regional councillor who initiated this project soon realised that labour market information is often complex, and a comprehensive picture requires the integration of a variety of data. This led to a request to find a tool to communicate and share in a synthetic way the information which could be of interest to different labour market stakeholders. The system therefore evolved and was constructed to be easily used by different categories of stakeholders, as it was designed and planned already in the perspective of open data. Data from different sources and quite diverse in nature are integrated into a single system, thereby providing a (relatively) complete picture. Moreover, the system makes easily accessible sets of data on flows that previously were seen and used only within administrative offices; there is a single point to access data that are updated and made homogeneous and comparable. A possible weakness of the system relates to the methodological choices that had to be made in order to decide which data were to be included and/or integrated into the system. Other sources on labour market variables do exist, but were not included. On the other hand, the system does have the potential to evolve into a series of dashboards which provide customised information to specific categories of stakeholders, e.g. employment services providers, trade unions, etc.

4 Discussion

In order to gauge the extent to which our case studies reflect the founding principles of open government, we propose a framework based on the following dimensions: administrative levels involved, link between objectives and open-government principles, technologies used, and difficulties that emerged during the design and the implementation phases. The framework is based on Martin's (2009) three forms of citizen engagement, enriched through a selection of variables—the level of openness and the degree of ICT use within each form of public engagement—derived from the literature on open government and on collaborative services supported by social media.

An exploration of the concept of 'openness' is provided by Smith et al. (2008), and is related to the development of ICT. Openness is analysed at three different levels: (a) universal over restricted access to communication tools and information (e.g. access to the telecommunications infrastructure through a mobile phone, or access to an online content or government information), (b) universal over restricted participation in formal and informal groups/institutions (e.g. SMS to mobilise political protests, or e-government implementations that provide increased transparency and new accountability arrangements), (c) collaborative over centralized production of information, cultural content, and physical goods (e.g. collaborative production of school textbooks, co-creation of government services, or mesh networks). In our framework, each of Martin's (2009) forms of engagement finds a link with the corresponding level of openness suggested by Smith et al. (2008). Moreover, such openness levels can be further detailed by introducing three corresponding degrees of ICT use. By considering the evolution of e-government services and their supporting technologies, we can see that the first level of openness is typical of the first generation of e-government services, featuring an early use of ICT and Web 1.0 technologies (Fugini et al. 2008). The second level represents new e-government services with an emerging use of social web technologies. The third level represents the most mature form of e-government services, the Public Services 2.0, with a consolidated use of social media and open data.

The resulting framework is a combination of three sets of variables to be employed in the analysis of the case studies: (a) information, first level of openness, early use of ICT, (b) consultation, second level of openness, emerging use of ICT (social media), (c) co-production, third level of openness, mature use of ICT (Public Services 2.0, open data). Given the strong conceptual correspondence between Martin's (2009) engagement forms and Smith et al. (2008) openness degrees, we used the terms which relate to the engagement forms (information, consultation, and co-production) to define also the three degrees of openness.

Table 1 summarises the descriptive dimensions of the case studies, together with the difficulties that arose during the design and the implementation phases.

In Tables 2 and 3 our framework is applied to the four cases. Table 2 provides a picture of the four case studies by taking into account the levels of stakeholder engagement during the design and implementation phases. Only the case of Milan

Table 1 Summary of case studies descriptions

		Cases			
		Milan	Magenta	Monza and Brianza	Piedmont
Descriptive dimensions	Administrative level	Municipal	Sub-provincial	Provincial	Regional
	Open-government principles	Participation	Transparency	Transparency	Transparency
	ICT output	Georeferenced mashup	Data warehouse and information system, online platform	Data warehouse and information system, web portal	Statistical information system, web portal
Difficulties	Design	Lack of complete information on private supply; inadequate evaluation of services demand	No comprehensive and reliable information on the services provided by private suppliers; no complete mapping of the suppliers; nonhomogeneous data	No involvement of municipalities	Choices made implied restrictions on types of data to be included in the system
	Implementation	PDF documents as output, no updating; no integration with departments of municipality	Platform not available to the public, not fully exploited	Lack of information on the public supply of services, no data on users nor on services flows	Lack of involvement of citizens/stakeholders

is characterized by *co-production* during the design phase, as a variety of public and private actors were involved in addition to the municipality itself. In the other three cases, the leading public administration did not explicitly engage other actors in the design of the system (with the exception of a public university research centre, CRISP, providing the necessary specialised support). As for the implementation phase, both Milan and Magenta show that a certain degree of *consultation* took place: with the citizens and other stakeholders in the first case, with the other municipalities of the district in the second case. This was partly due to necessity, as in the case of Magenta, where the other municipalities had to provide data that were otherwise not available, or due to opportunity in the case of Milan, where additional

Table 2 Levels of stakeholder engagement in the design and implementation phases

Phases	Levels of stakeholder engagement	Cases			
		Milan	Magenta	Monza and B.	Piedmont
Design	Information Consultation		x	x	x
	Co-production	x			
Implementation	Information Consultation	x		x	x
	Co-production		x		

Table 3 Degrees of openness and ICT use

		Cases			
		Milan	Magenta	Monza and B.	Piedmont
Degree of openness to citizens	Information Consultation	x	none		
	Co-production			x	x
Degree of ICT use (in support of policy-making)	Early (low)	x			
	Emerging (medium)		x	x	
	Mature (high)				x

data were collected on the demands and needs of service users (so as to supplement the estimates produced by the municipality's statistics department). In the case of Monza and Piedmont, the leading public administration carried out the implementation without the collaboration of other stakeholders—though with some delays in the case of Monza—because the relevant data were either publicly available or had recently become so in the form of open data.

Table 3 shows the degrees of openness and of ICT use in the case studies. These variables are considered by focusing on the extent to which they can support citizens' participation in the policy-making process through the system built within each case. The Milan case, for instance, produced as output a document in PDF format, accessible on the municipal website. This was categorised as low degree of openness (corresponding to the *information* level) and low degree of ICT use, because this solution gives little opportunities for citizens' engagement in policy-making because the PDF format is not machine readable and is hard to reuse; also, the municipality's website did not provide users with any built-in instrument or channel for dialogue or collaboration with the public administration itself. The Magenta case does not have any degree of openness as defined here, because the data and the final product are not publicly available. On the other hand, the technological output, a statistical information system with a data warehouse as in the case of Monza and Brianza, corresponds to a 'medium' degree of ICT use because it provides a wide choice of innovative tools to analyse and visualize the data, though without offering social media or collaborative solutions to transform the service into a Public

Service 2.0. The Monza and Brianza and Piedmont cases have in common the same *consultation* degree of openness, because they provide a web portal as interface of the data warehouses, with georeferenced maps and tools to filter data. Furthermore, the Piedmont solution achieves the highest degree of ICT use due to the possibility to download open datasets. However, we must emphasize that neither of the two provides users with a channel to start a dialogue with the administrations, nor with an instrument to activate co-production processes.

5 Conclusions

The cases described in this chapter represent a significant effort that is currently under way in Italy, at several administrative levels, in order to implement the founding principles of open government. While not representative of all Italian experiences, these cases allow us to draw a number of lessons, which point to aspects and variables that should be taken into consideration also elsewhere.

As for the core principle of *transparency*, three cases (Magenta is the exception⁹) feature data and information made available to the general public, thereby showing a degree of openness which has for a long time been unusual and relatively rare in Italian public administrations. However, real and complete transparency is only allowed by open data: where data have already been processed and analysed, their form reflects the choices and the interpretation framework that are proposed by the analyst. Our cases present different degrees of transparency in this respect: there are still some gaps and limitations, but given the general Italian context and the pace of evolution in recent years, we do witness a significant effort.

As for *collaboration*, our cases show that the availability of open data reduces the need to collaborate with other stakeholders in the project implementation phase (as in the cases of Monza and Brianza and Piedmont). As for collaboration between public administrations, citizens, and other stakeholders in support of policy-making, our cases present a mixed picture: In the case of Monza and Brianza, valuable and constructive data are available, but need to be processed extensively by the user; a better situation is represented by the case of Piedmont, but none of our cases reflect the so-called Public Services 2.0. In all cases, stakeholders who are willing to contribute to the policy process need to act proactively through other channels in order to get in touch with the relevant administration, with the related difficulties and required effort. Relative to several Italian experiences, these are new-generation e-government services, which, however, do not rely much on social media, thereby reflecting an approach where public administration does not appear to be willing to co-produce services or policies.

⁹ In the case of Magenta, the original plan was to create a data warehouse that was not publicly available, and this objective did not evolve over the course of the project, as was the case, for instance, of Piedmont.

In terms of *participation*, available data and technologies could allow the development of public–private partnerships exploiting public data and social media. However, the instruments developed in our cases do not allow real co-production. In order for the latter to be carried out, a different approach should be adopted at the outset, with different objectives and methodologies, and the related different technologies.

These considerations lead to a few managerial implications which arise from our cases studies. While not necessarily universal, they suggest that a number of issues should be carefully considered by decision-makers who are planning to introduce open-government initiatives. The availability of open data allows greater autonomy to the public institution wishing to develop a certain system or instrument; where the relevant data are ‘non-open’, the institution needs to foster and sustain the necessary cooperation with the subjects, be they public or private, who hold the data (with all the related costs). This implies that, whenever effective collaboration among relevant stakeholders is put in place in the design phase, the implementation phase can produce a satisfactory result also without cooperation. The leading public institution can engage the stakeholders in the design phase, and later entrust the implementation to a public or private specialised subject who develops the application or the technological instrument. Open data therefore reduce the coordination costs of these initiatives.

The cases of Magenta and Monza and Brianza also show that, whenever implementation requires cooperation among different administrations, the willingness to collaborate needs to be verified and promoted, and not taken for granted. This holds both for administrations that are at the same level of government, such as the municipalities in Magenta’s case, and for those occupying different levels, such as municipalities and the province in the case of Monza and Brianza. These problems may also be exacerbated by political cycles and their implications at different levels of government, because the lack of political affinity may strengthen the perceived power that is allowed by the control of data and information, further enhancing the reluctance to relinquish control on such data.

Our cases also show that the commitment of the individuals at the apex of the leading organisations is very important for the overall success of the initiative. This was the case especially for Milano and Piedmont, where the local *Assessori* played a critical role in pushing the projects in a certain direction, and in ensuring participation and commitment on the part of the individuals and the departments involved. These cases prove a significant shift in the role of the governance and management bodies, from bureaucratic to facilitator.

By taking into consideration all our dimensions, we can say that the case of Piedmont is the most advanced among those analysed here. It is also an example of how the learning process carried out over time by the supporting research centre, CRISP, allowed the avoidance or solution of problems similar to those of the previous cases. Relative to the other cases, the design and implementation process was easier and smoother, partly due to a strong input and motivation provided by the person at the apex of the main public administration involved, who provided a strong political push. Also, in a sense, this initiative evolved in a sort of reversed

way: starting from something more limited, which then became a wider instrument to be used by a wider audience. The previous initiatives were born with certain objectives, which then had to be scaled down because of intervening problems; here the objective itself evolved along the way. This case therefore showed that, once the organisational and bureaucratic resistances were overcome or avoided, an effective and satisfactory result could indeed be reached.

Our case studies suggest that open government may support stronger participation and especially higher effectiveness of public services provision, because it allows a better understanding of citizens' needs. This can lead to the co-definition of such needs, and not only—as in most forms of current public participation—of the answers to those needs (Mariani and Cavenago 2013). An additional benefit relates to the possibility of enhancing also the effectiveness of these answers, as they become more modular. In this respect, further research is required to explore the mechanisms and forms for policies and services to become more modular and integrated based on the potential of open government.

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The Impacts of Social Media on Government and Democracy: An Examination of Municipal Usage in Nova Scotia, Canada

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1 Introduction

In an era of openness and virtualization, this chapter explores social media usage by local governments and candidates for elected office in the Canadian province of Nova Scotia. Our examination draws from a wider set of findings in Canada and elsewhere that suggest an emerging set of contradictory forces with respect to social media (SM) usage by governments for both political and administrative purposes: whereas SM is said to be a driver of wider engagement and new participative capacities, much of its usage is often deployed for informing and communications instead (Roy 2013). These contradictions stem from the complexities of SM usage and its impacts on traditional democratic and administrative governance systems devised long before the mainstream arrival of the Internet (to say nothing of the more participative variant of online activity and platforms denoted as Web 2.0). The term “contradiction” implies some truth to both sides of these debates and underscores the importance of empirical examination, a key objective of this chapter. While social media may often be more visible politically and administratively at national levels, the counterargument and upside of examining local government is that this latter realm, featuring a wider range of smaller jurisdictions and organizational units, typically leads public sector reform in a bottom-up manner (*ibid.*).

Accordingly, we sought to review and assess SM trends (in terms of presence and usage) within the Nova Scotia municipal public sector from both administrative and electoral vantage points. During the fall of 2012, we cataloged the online presence of all local governments in the province with a social media presence, as well as the candidates for elected office in the largest urban centers (this chapter’s reporting in terms of electoral candidates is limited to the Mayoral contest of the

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largest of these cities). Our methodology and findings are presented as follows: A literature review of social media's impacts on democratic governance, and the opportunities and challenges associated with Web 2.0 and like-minded calls for Gov 2.0 is the focus of the next section. The third section presents the main contours of our empirical review as well as select examples of social media usage by governments and candidates, and the fourth section concludes this chapter by way of overall lessons learned as well as limitations of our findings and possible avenues for future research.

2 Social Media and Governance: Opportunities and Challenges

Social media and Web 2.0 are driving the emergence of Gov 2.0-stylized experimentation in efforts to realize the open and collaborative value of “ubiquitous engagement” (Lee and Kwak 2011). This transformative potential is intertwined with a number of important trends confronting the public sector. These trends include the need for greater transparency and accountability of government, better access to public services, greater citizen engagement and improved adoption of emerging technologies (Huijboom et al. 2009). These trends are occurring against a backdrop of declining voter participation and engagement, and decreased satisfaction and trust in government (Tapscott et al. 2008).

Wikipedia defines Web 2.0 as going beyond static websites that characterized early versions of online platforms toward an interactive and collaborative experience through a social media dialogue as creators of user-generated content through a virtual community. A subset of Web 2.0, then, social media enables users to create their own public profiles and connect to others through various networks of friends, organizations and interests (Mossberger and Wu 2012). A stark contrast to the hierarchical parameters of structures of representational democracy, this nexus of virtualization and empowerment is thus characterized by the presence of networks, flexible connections, and transient audiences (OECD 2009). Currently, three of the more popular social media tools in the western world are Facebook, Twitter, and YouTube, though numerous other platforms exist across countries and cultures.

Opportunities

There are three interlinked opportunities for the public sector in using Web 2.0, and in particular social media. First, there is opportunity for communication and information sharing. At minimum, Web 2.0 serves as a communication and information dissemination tool, and as another medium by which elected and government officials can interact with the public (Sandoval-Almazan and Gil-Garcia 2012; Morison 2010). More broadly, Web 2.0 has afforded organizations and movements outside

of government new means of producing and exchanging information (Mossberger and Wu 2012). Citizens and other organizations are then free to use and analyze that information for a variety of purposes (Morison 2010). Governments, moreover, can leverage new social media channels in order to disseminate information and messaging more widely and more efficiently.

Second, there is opportunity for enhanced public participation and engagement. Since Web 2.0 is based on a culture of sharing, collaborating, socializing, and openness, it creates a potential for government to establish a new participatory dimension online to generate greater civic engagement (Tapscott et al. 2008; Mossberger and Wu 2012). Dialogue between government and citizens is an important element to democratic discourse and Web 2.0 offers an opportunity for individuals to interact with government and other citizens in an alternative setting (Mossberger and Wu 2012). Web 2.0 can therefore enrich government interactions with external stakeholders and the public by providing access to built-in networks (Embaye et al. n.d.; OECD 2009).

A third opportunity is innovation. Since Web 2.0 affords flexibility, openness, and collaboration, the public sector can leverage such traits in taking positive advantage of the horizontal characteristic of Web 2.0 and its' users, to find innovative applications for information sharing and service delivery. The primary example of this is the idea of crowdsourcing where governments can turn to the online community as a collective to solicit solutions, services, or ideas to problems (Serrat 2010; Tapscott et al. 2008). Governments have access to expertise outside of their organizations and benefit from the free flow of information, interactivity, and collaboration that is the foundation of Web 2.0 (Bonsón et al. 2012).

These opportunities in turn provide several broader benefits to the public sector in terms of an expanded, more open and more participatory set of governance mechanisms for both policy-making and service delivery (Fyfe and Crookall 2010). Such improvements can lead to improved public trust in government (Sandoval-Almazan and Gil-Garcia 2012).

Challenges

With the opportunities and benefits, especially in terms of citizen engagement, also come several challenges. The biggest challenge is bridging the rigidity of government with the flexibility of Web 2.0. Government bureaucracy can be characterized as closed, vertical or hierarchical, and formal; Web 2.0 on the other hand is open, horizontal, and relatively informal (Huijboom et al. 2009). Web 2.0 effectively challenges the traditional structure and purpose of government by generating public value that was previously exclusively provided by government (Huijboom et al. 2009). Since Web 2.0 is inherently networked and collaborative, in order for government to leverage the advantages and opportunities, government too will need to change and adapt to meet the flexibility and openness of Web 2.0 (Huijboom et al. 2009). As a result, Web 2.0 has the potential to be very disruptive because of

how it challenges established institutions and the routines built around those institutions (Huijboom et al. 2009; Klang and Nolin 2011). Adopting Web 2.0 and adapting to this new model therefore requires leadership and executive support (Fyfe and Crookall 2010).

The rigidity of government also means that government is often tempted to use Web 2.0 in a technocratic manner and focus on aspects such as back end streamlining, administration and modernizing existing government functions instead of deeper innovations that allows the public to be more involved (Huijboom et al. 2009). Moreover, governments end up using tools such as social media more like traditional media focusing on messages, instead of understanding conversation and engagement (Weeks 2012). Governments continue to try to control the message and medium, and miss the fact that these tools do not actually belong to government but in fact belong to the users (Weeks 2012). Moreover, in using Web 2.0 in a traditional manner and trying to control the medium, government loses the essence of openness that is at the foundation of Web 2.0 (Klang and Nolin 2011). It can be a difficult concept to understand as it essentially amounts to a transfer of power from bureaucrats and politicians to citizens (Hand and Ching 2011). Using Web 2.0 to its' potential therefore requires a culture shift within government from one that values hierarchy and formality, and is characterized by silos, to one that values horizontalness and collaboration and is more networked driven (Huijboom et al. 2009; Serrat 2010).

A second major challenge is recognizing that Web 2.0 is a supplement to established tools and mechanisms, not a replacement (Association of Local Government Information Management Inc. 2009). Moreover, it is just that; a tool (Maier-Rabler and Huber 2011; OECD 2009). Implementing Web 2.0 technologies do not necessarily mean improved citizen engagement or communication or a better democratic discourse (Maier-Rabler and Huber 2011; OECD 2009). The principles that underpin Web 2.0 facilitate potential improvement but are largely a means to an end (OECD 2009). There still needs to be a discussion on the purpose and use of the tool, what goals government is trying to accomplish in using it, and how success is going to be measured (Fyfe and Crookall 2010).

Simply having a Web 2.0 presence does not mean an organization is taking advantage of the opportunities Web 2.0 allows nor does it mean engagement is meaningful. Not all Web 2.0 tools will fit all contexts, and deep-rooted issues of apathy, distrust, conflict, and lack of coordination cannot be solved by these tools (OECD 2009). Governments using Web 2.0 need to make concerted efforts to involve citizens through these tools by providing opportunities to make decisions and affect outcomes and not just use them as another message bot through which citizens continue to passively consume information (Hand and Ching 2011). How well this works will depend on practice and policy, and to what extent governments use the technology for participation as it was designed (Maier-Rabler and Huber 2011).

Other challenges to governments in implementing Web 2.0 tools include a lack of time and resources, potential information overload, and low participation. Governments may have good intentions for using and implementing these tools but may lack the time, expertise, and capacity to pursue or maintain it (Embaye et al. n.d.; OECD 2009). This can be a very significant problem because creating a Facebook

page or a Twitter account and then not maintaining and engaging users leaves a negative impression and only serves to further disenfranchise citizens from the democratic process (Embaye et al. n.d.).

The proliferation of social media and other Web 2.0 tools also means that governments are competing with other individuals and entities to keep citizens interested (OECD 2009). There is so much information available on the internet and through these tools that individuals may feel a sense of overload (OECD 2009). This is compounded by the fact that these tools do not guarantee citizen participation nor does it necessarily represent the population. Like any other consultation mechanism, citizens can still be apathetic and uninvolved, and the citizens consulted through these mediums may only represent a certain segment of the population (ibid.). Actually transferring their ideas and opinions into initiatives can therefore be very difficult and bring up concerns about representativeness (Mota and Santinha 2012). The internet also allows for anonymity which can result in having disruptive participants who negatively impact trust and collaboration (Embaye et al. n.d.).

From Informing to Engaging

In reviewing the literature on Web 2.0, a spectrum of how governments use and focus social media in regards to citizen engagement emerges. This spectrum, influenced by Lee and Kwak (2011) and International Association for Public Participation (IAP2, 2007), has three stages of engagement: one-way communication, two-way communication, and full engagement. Each of these stages, including examples from the public sector, are described below.

In the first stage, social media and other Web 2.0 tools are used to inform citizens. The platform functions as a one-way communication tool from government to citizens. This includes not only keeping the public informed but also basic data transparency where government information, processes, and policy is shared online (Lee and Kwak 2011; IAP2 2007). There could also be minimal engagement whereby the public sector sets up the online social media infrastructure in order to maintain the organization's brand and prepare for future use but may not currently use the platforms (Embaye et al. n.d.). In general, the public sector benefits from increased public awareness, increased accountability, and a shift to openness (Lee and Kwak 2011).

Governments and politicians can easily employ social media for the basic purpose of informing by using mainstream social media tools such as Facebook and Twitter as message mediums. The point is not to get input or a response from the public, but rather to simply send information out (Embaye et al. n.d.). Local governments may find this particularly useful as a means to send out reminders about tax bills, road closures, or maintenance issues (Embaye et al. n.d.). Transportation agencies have found this basic use to be particularly useful for communicating travel time information including delays, service interruptions, route changes, and more (Transit Cooperative Research Program (TCRP) 2012). For politicians, social

media can serve as a minipress release function. Any announcements, priorities and platform, events and commentary on issues can simply be sent out as a status update on Facebook, as a tweet on Twitter, or as a video on YouTube (Clarke 2010). There is nothing about any social media site that forces individuals or agencies to be “social.” Social media can be just “media” (Weeks 2012).

In the second stage, Web 2.0 technologies go a step further and are used to interact with citizens as a two-way communication tool. Trying to limit communication to a one-way relationship as in the first level is difficult to do as the mediums demand this two-way relationship (i.e., demanding the “social” part of social media). This two-way communication stage is interactive and focuses on mainstream social media channels such as Facebook, Twitter, and YouTube. The focus is on informal conversations, generating feedback, acknowledging concerns and crowdsourcing. Organizations benefit from having real-time, instant feedback from the public, and building a community-based conversation about the business of government (Lee and Kwak 2011; IAP2 2007). This stage requires active participation and regular monitoring, and organizations need to be responsive and timely (Embaye et al. n.d.).

Both governments and politicians can leverage Web 2.0 at this level. For government, this is a great way to generate informal channels of participation and build a foundation toward something more institutionalized. The mediums can also be used promotionally by using contests or getting users to participate in the events (Embaye et al. n.d.). For politicians, it is an additional means of connecting with constituents, campaigning, and generating support by interacting and being responsive over the social media network (Clarke 2010).

An example of this second stage is TransLink in Vancouver, Canada. TransLink is the regional transportation body in the Metro Vancouver region that provides public transit services. The organization has several social media applications but Twitter has emerged as a key part of TransLink’s customer service and information sharing strategy. Their use of Twitter started out as an experiment during the 2010 Olympic and Paralympics Winter Games as a means to communicate with the press but the organization found that they were also fielding questions from customers. Traffic on Twitter fizzled after the Olympics but employees in the organization saw a potential for using Twitter as a complement to their call center and built a business case that resulted in a 1 month pilot in November 2010 (the medium is now a permanent part of TransLink’s communication and customer service apparatus).

Twitter is not only used to provide transit service information and updates but it is also used to respond to questions, concerns, comments, and inquiries. TransLink quickly learned that users expect two-way conversations and has therefore learned to build relationships with their followers. “TransLink believes that social networking is not just a way for agencies to repackaging their traditional customer communications. Instead, agencies have to be prepared to respond to customers in the social space and to engage them in conversation” (Transit Cooperative Research Program 2012, p. 37). Moreover, this has given TransLink insight into what customers are thinking, how they view the service and what they think is being done wrong. This direct line to customers has not only benefited the organization in how they interact

with their customers but it has also provided insight into service delivery (ibid. 2012).

At the highest level, Web 2.0 technologies enhance collaboration and engagement. The public is more heavily involved in solving complex problems and issues, governments and agencies work together on joint projects and decision making, both the public and private sector is leveraged to create value-added services, and public engagement is integrated into the governance structure (Lee and Kwak 2011). Government looks to the public for advice and innovation, and partners with the public on decision making. Government could go as far as empowering the public to make the final decision by agreeing to do whatever the public decides (IAP2 2007).

There are not many examples of public sector organizations employing initiatives at this stage especially in terms of social media. However, public sector organizations are discovering the potential of Web 2.0 applications and experimenting with how they can be used to leverage greater civic engagement. In particular, some local governments in Canada are using Web 2.0 applications as a new means of participatory budgeting and then using social media as a means of communicating the opportunity. The City of Calgary employed an online budgeting tool in February 2011 as part of a budget planning engagement process known as “Our City, Our Budget, Our Future.” The budget tool allowed residents to view current departmental spending and see how changes would affect various city services. Citizens could also submit their priorities and ideas for the budget which were then incorporated into final budget deliberations by council. This input, from 24,000 people, resulted in property tax increases and additional funding for transit. The city also produced an easy to read budget report that laid out what the budget was going to do and how the public’s input from the engagement exercise was incorporated into the budgetary decisions of each policy area (Thomas 2012; City of Calgary n.d.). Toronto and Vancouver have also experimented with participatory budgeting using Web 2.0 (Thomas 2012).

3 Local Government Usage in Nova Scotia

Our research examined social media use in all 54 municipalities in Nova Scotia, as well as all candidates in the Halifax Regional Municipality (HRM) and Cape Breton Regional Municipality (CBRM) local elections in the autumn of 2012. This chapter summarizes some of the main trends from this province-wide review—while offering select case studies in order to illustrate the specific usage and approaches of both municipal organizations and candidates for elected office.

Social media was confined to Facebook and Twitter with exceptional usage of any other platforms noted. The following Facebook characteristics were noted: whether the account was a page or a profile, the number of “likes,” the frequency and type of posts, comments by the public, and interactions with other users. For Twitter, the following characteristics were noted: the number of “followers,” the

frequency and type of tweets, and the content of tweets. For both mediums, a qualitative assessment was made on the type of engagement (one-way communication, two-way communication, or full engagement) with particular attention paid to how present and active the user was, and whether the user was soliciting feedback, responding to inquiries, or simply sending out information. The websites of municipalities were visited to find links to their Facebook or Twitter pages.¹ If no links were readily found, a Google search was conducted. For the municipal election in HRM, the candidate list provided by the municipality was used. This list had full contact information including websites which were visited to find links to social media pages. If no website was listed or if social media links were not readily available, a Google search was conducted. For CBRM, there was also a list of candidates provided by the municipality. However, it did not have contact information so websites and social media pages were found via a Google search.

Overall, we found that nearly half of Nova Scotia municipalities use Facebook while only a quarter use Twitter. Of 27 municipalities with a population up to 5,000, 13 are using Facebook and nine are using Twitter. Of 11 municipalities with a population between 5,000 and 9,999, seven are using Facebook and only one is using Twitter. Of the 14 municipalities with a population between 10,000 and 49,999, two are using Facebook and two are using Twitter. Of the two largest municipalities (populations greater than 100,000), both are using Facebook and only one is using Twitter. There are a couple of instances where a Facebook or Twitter page exists for a municipality but it is unclear whether they are official pages as there is no link from the municipal website nor does the descriptor on the social media page give any indication. There are also several municipalities with poorly designed websites that made finding their social media information difficult and frustrating.

The majority of municipalities in Nova Scotia are engaged in one way communication on both social media platforms. Overall, the municipalities are focused on informing, are very minimalist in their maintenance of their pages and are simply maintaining an online profile. On Facebook, municipalities provided information about city services, recreation programs, events, cancellations, and weather conditions or warnings. Individuals from the community often posted with their own information about events in the community but there was little acknowledgment from the page owner whether it be a confirmation, a “I Like” or a “thank you for sharing.” One of the interesting aspects to Facebook usage are the several cases where the municipality did not have a main municipal Facebook page but the recreation department does. This makes sense given that Facebook is an easy platform within which to provide up-to-date information on recreation programs, when they are happening and if they have been cancelled, especially since Facebook allows users to create “events” and invite people to those events.

¹ In our reporting below, we have tried to verify the ongoing existence of relevant social media pages as per the noted address, though some pages may have been altered since they no longer appear. As noted in our chapter, this is particularly prevalent with respect to candidates during and after the election period.

On Twitter, there is very little engagement, very little re-tweeting and few conversations. There are several cases where there is little understanding of the need to customize content to the medium. Twitter accounts are often synced with the Facebook page and so whatever is posted on Facebook is the same content that shows up on Twitter. Given that only a small number of municipalities have adopted Twitter, it was difficult to assess their usage. It is clear that this is still a new medium that Nova Scotia municipalities are learning to use.

Halifax Regional Municipality

HRM is the largest municipality in Nova Scotia with a population of nearly 400,000 (Nova Scotia Community Counts 2011). The city's social media presence is quite expansive and comprehensive with multiple Facebook and Twitter pages, each for a different purpose. The city also uses YouTube, blogs, and RSS feeds (Halifax Regional Municipality n.d.)

HRM's Facebook and Twitter pages are dedicated to a variety of departments and areas including transit, events, policy, planning, youth, and community. Some departments have a presence on both Facebook and Twitter while others use only one platform, and each department uses the social media platforms differently. For example, the city's public transit department, Metro Transit, is on Twitter only and like other transportation agencies, uses Twitter to communicate service information especially as it relates to traffic delays, schedule changes, detours, and service reminders. The department also responds to customer questions and concerns, with official complaints re-directed to the city's 311 service. It is important to note that Metro Transit is only online between 8:30 am and 4:30 pm (<https://twitter.com/hfxtransit>).

On the other hand, Plan HRM, which has a Facebook and Twitter presence, is a dedicated citizen portal for information and feedback on regional and community planning projects. Citizens are provided with links to documents, information about open houses and surveys, and an opportunity to give their input. While the page does not have a lot of "likes," it tries to generate an environment of discussion and conversation through posts and encourages users to share the information posted. Their Twitter page unfortunately is not as well utilized with the majority of tweets being made up of re-tweets of HRM's official Twitter page (<https://www.facebook.com/PlanHRM>; <https://twitter.com/planhrm>).

Another Facebook page, "Good Neighbors, Great Neighborhoods," takes the Plan HRM Facebook page a step further. The page is a place for residents of HRM to "connect online and exchange information which will help us [HRM] create—and celebrate—great neighborhoods where we live, work and play" (Good Neighbors, Great Neighborhoods n.d.). Once again, the intention is good with HRM trying to give residents an online environment where they can interact with one another and bring their ideas for HRM to the city's attention. The Facebook page also tries to promote discussion by sharing links and news about community development and

public consultation events. Unfortunately, the page suffers from a lack of engagement on the public's end with only 500 "likes" and very few, sporadic posts and comments by the public (<https://www.facebook.com/PlanHRM>).

HRM's use of social media places it firmly in the second stage of citizen engagement. The city is very much trying to engage in a conversation with residents and providing multiple platforms and opportunities to do so. The one area that HRM is lacking in is data transparency. HRM currently does not have an open data portal but is working toward establishing one. This should help enrich the city's interaction with residents as they have easier access to information and as the city builds a stronger online platform that allows for more collaborative opportunities for citizens.

After HRM, CBRM is the next largest municipality with a population of just over 100,000. However, it does not really have a social media presence. There is no general dedicated CBRM Facebook page or Twitter account. There is a Facebook page dedicated to raising awareness about physical activity opportunities in CBRM called "Active Living CBRM" and it does just that by posting information about hiking trails, sports events, healthy living, and more. The mayor is also on Twitter. However, that is as far as their social media presence goes and given the size of the municipality, this was a surprising finding.

Town of Berwick

The Town of Berwick is a small municipality located in the Annapolis Valley. With a population of just over 2,400 (Nova Scotia Community Counts 2011), the municipality boasts a Facebook following of over 2,100. Berwick's Facebook page is an active community with both the municipality and residents actively using the platform to provide news, event information and recreation information. Berwick posts updates almost daily, and responds regularly to questions and comments by residents. The page reads like an online version of a community hall where residents are discussing whatever is happening in the community, are raising questions and concerns about various issues, and are recognizing the work being done by residents and town workers. The page is also very personal with residents clearly knowing the individual behind the municipality's posts, often referring to the individual by first name (<http://www.facebook.com/pages/Town-of-Berwick/160216961715>).

Berwick's success with establishing such an open, personal, and welcoming online environment can partly be attributed to the fact it is a small town. Users who post and comment on the town's Facebook page, cannot be anonymous since everyone knows one another. This has resulted in improved civility, avoiding potential disruptive individuals as users are held accountable for what they post (Roy 2012). As a result, Berwick's use of Facebook falls closer to the third stage of engagement given the collaborative nature of the online discussions.

Berwick's success with Facebook is partially muted by the municipality's ineffective use of Twitter. Their Twitter account has a decent base with over 500

followers. However, the tweets are synced to the Facebook page's status updates. Therefore, the only tweets that show up are the status updates the town makes on Facebook. There has been no effort made to customize tweets so they fit Twitter's 140 character limit nor is there any engagement with followers. The municipality's Twitter account does not mention other users, it does not re-tweet other users or organizations, and it does not use hashtags (https://twitter.com/town_berwick). Berwick's use of Twitter therefore puts them within the first stage of one-way communication.

Town of Kentville

The town of Kentville, also located in the Annapolis Valley, is a small municipality with a population of just over 6,000 (Nova Scotia Community Counts 2011). Kentville has both a Facebook page and a Twitter account. The Facebook page is one of several examples of municipalities that have a dedicated Facebook page for their recreation department but do not have one general page for the municipality itself. This Facebook page is much like Berwick's Facebook page in that it has a good following (over 1,000 "likes") and an active presence. It is also very personal in the sense that users appear to know who is behind the municipality's posts. Kentville is responsive to other users' comments, and posts, and acknowledges contributions by other individuals who have information that is of relevance to recreation in the region. There is also a light-hearted air in a lot of the posts with the municipality willing to be funny and make jokes, particularly about the weather (<https://www.facebook.com/kentville.recreation>).

Their Twitter account, unlike Berwick's, is interactive. Kentville has over 500 followers on Twitter and while not nearly as active as on Facebook (tweets tend to be sporadic), the municipality does respond to questions. The platform is largely used to send out information about events in the community and information about public meetings. Kentville also uses the platform for promotional purposes such as contests in the community or awareness of the Facebook page. The account also shows signs of improvement over time as tweets are less rare than 1–2 years ago and as they also mention other users (<https://twitter.com/townofkentville>). Overall, Kentville's use of both Facebook and Twitter meets the characteristics of the two-way communication stage.

HRM Municipal Elections

Overall, HRM candidates used their social media sites to inform the public with a focus on the campaign trail. Posts and tweets about canvassing and public appearances were common as were links to newspaper articles and videos about a candidate and his or her platform. When voting commenced, candidates used their social media platform to remind individuals to vote, and provided information on

how to register, and where and how to vote. Very few candidates used Facebook or Twitter to share their platforms, perspectives, and issues. They did use the two mediums to provide links to their website where platforms were housed but often did not actively share or engage in debate through status updates or tweets where the public could comment and provide feedback. Some elements of platforms did come across when candidates responded to posts on their Facebook page or engaged in a conversation in Twitter, but there was little proactive encouragement.

There was also a prevalence of candidates who had a Facebook or Twitter account but hardly used it. This includes a couple of candidates in both jurisdictions that lacked any activity for up to 2 months before the election in October. Also notable is the number of Facebook and Twitter accounts belonging to candidates who were not elected that disappeared in the days immediately following the election. Conversely, there were also several individuals that did not win that decided to keep their social media accounts as a way to continue communicating with and engaging the public.

HRM had six candidates running for mayor and a total of 60 candidates running for the 16 councilor positions. Within the mayoral race, three candidates, Tom Martin, Fred Connors, and Mike Savage, used social media (both Facebook and Twitter) while the other three did not. Tom Martin was largely a one-way communicator using both platforms to inform voters about the campaign trail (<http://www.facebook.com/tommartinask4more>; <https://twitter.com/TomAskForMore>).

Fred Connors had a substantial social media presence making use of not only Facebook and Twitter, but also YouTube, Flickr (a photo-sharing platform) and Tumblr (a micro-blogging platform). Of the three mayoral candidates on social media, he was the most active and was very good about responding to individuals on Facebook and Twitter. The two-way conversation is something Fred Connors did very well and other users clearly appreciated his responses with several individuals thanking him for taking the time to respond to questions and being open to engage in a conversation. While his use of social media still puts him within the second stage of engagement, he was as close to the third stage of full engagement as one can get without it being an institutionalized process. Unfortunately, while his social media pages continue to exist, there has not been any activity since November 2012 (<https://www.facebook.com/fredforhalifax>; <http://twitter.com/fredforhrm>).

Mike Savage, who went on to win the mayoral race, had an interesting approach to his use of social media. He had two Twitter accounts behind his campaign, a personal one that he appeared to be using, and a campaign team one with the handle “@TeamSavage.” His Facebook page too was titled “ILikeMikeSavage.” These two accounts felt depersonalized given that the interaction was not necessarily directly with Mike Savage, but rather with his campaign team which in many ways defeats the purpose of social media and does not lend itself well to generating an authentic conversation with someone. Instead, those two accounts behaved like a traditional campaign media platform pushing out information about his campaign trail (<http://www.facebook.com/ILikeMikeSavage>; <https://twitter.com/TeamSavage>). On the other hand, Mike Savage’s personal Twitter account did have some two-way communication particularly through his use of “chatting”

with users (chatting is a popular communication vehicle on Twitter whereby users, often celebrity and public figures, will set aside a time within which they promise to respond to any questions directed to them over the platform).

4 Conclusion

Overall, our findings confirm that municipalities and local politicians in Nova Scotia use social media primarily as a one-way information sharing device, albeit with evidence of widening two-way experimentation. Social media platforms are still new for local governments in Nova Scotia with only half of the province's municipalities, and half the local politicians in HRM and CBRM trying to use the medium. At present, then, Nova Scotia municipalities' usage of social media fits dominantly within the first stage of citizen engagement (i.e., informing), the bottom rung of the typology outlined by Lee and Kwak (referenced above in the literature review).

Looking ahead, there appears to be a basis for a widening cleavage between HRM, the province's largest urban municipality, and the rest of the Province in terms of social media-driven democratic and administrative governance usage and experimentation. There are three reasons for the predominance of HRM in this regard: its urbanized and concentrated populations both offline and online, the considerable usage of social media by HRM municipal bodies prior to the elections in 2012, and the election of Mike Savage as Mayor (who campaigned on the themes of open government with social media and online transparency and dialogue predominant themes). Even prior to the election, HRM Council had approved its first ever open data policy, following the lead of many other governments around the world. On the other hand, smaller town examples such as Berwick and Kentville demonstrate that social media usage need not be limited to urban domains, and moreover that a more sparsely populated community with greater familiarity among its residents may also translate into a richer integration and alignment of offline and online channels of engagement (admittedly a point more suggested than proven by the data examined here, and one denoting a promising avenue for future research).

There are limitations to note in regards to the assessment of social media use in Nova Scotia at the local government level. The range of social media networks and styles makes it difficult to compare across municipalities and politicians. As well, some municipalities and politicians have not yet developed a significant following on Facebook or Twitter which makes their ability to engage the public difficult. We also have no way of knowing, for purposes of this chapter, if and how municipalities and candidates may be using the private functions of Facebook (private messages) and Twitter (direct messages) to engage with their audience.

Overall, then, there are clearly still some challenges that remain in getting governments and politicians in Nova Scotia to move up the chain of engagement. Implementation of open data initiatives, and more widespread adoption of social media and other Web 2.0 technologies could well become drivers of wider and deeper forms of engagement and dialogue. As Web 2.0 technologies continue to proliferate

and governments continue to adopt the technologies in pursuit of improved citizen engagement, a more open, online, and interactive public sector, both administratively and democratically, would seem both necessary and unavoidable, much as it is likely that tensions between informing and engaging shall shape this evolution for some time to come.

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Understanding the Dynamics of Open Data: From Sweeping Statements to Complex Contextual Interactions

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1 Introduction

Governments all around the world are developing policies and practices to make their datasets available to society (Harrison et al. 2012a, p. 903; Ganapati and Reddick 2012). Key political acts were the public sector information directive in the EU (2003) and the open-government directive in the USA (2009). Opening up government data is often assumed to be a “good thing”: making public resources available to citizens is assumed to generate new economic activity and contributes to a “strong democracy” (Lathrop and Ruma 2010). The key argument for open data is that open access to public sector information is of greater economic, social, and political benefit than exclusive exploitation of this information. Successful examples are mentioned by open data proponents to highlight the benefits and create support for this change (Noveck 2009).

At the same time, our academic knowledge about the effects of open data is still surprisingly limited. Impact studies tend to focus exclusively on the economic gains of open data. Based on rather controversial methods, the European Commission

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(EC) extrapolates the impacts of open data and concludes that open data may result in an economic growth of 40 billion euros (Kroes 2011; Kronenburg et al. 2012, p. 11; Vickery 2011; Hoog et al. 2012). This number is controversial since the EC calculates how much it would cost the government to develop all the apps that have been and will be developed on the basis of open data. One could raise the question whether government should ever do this and what all these apps actually contribute to economic development. The EC study may help to generate support for open data but the foundations for their optimistic claim of impact seem rather simplistic.

This chapter challenges the effect study for the EC for three reasons. Firstly, this study only focuses on economic effects of open data and not on other desirables such as a clean environment, good education, equitable health care, etc. Luna-Reyes and Chun (2012) correctly note that open data are about realizing public value and not only generating wealth. Secondly, these models assume a linear development: open data are introduced and bring about the desired change. The studies do not take the dynamics of the interactions between the various stakeholders into account that may result in unpredictable and unforeseeable outcomes. Thirdly, the studies for the EC do not acknowledge the variation of open data incentives, practices and consequences between countries and business sectors (Veenswijk et al. 2012; Kronenburg et al. 2012; Hoog et al. 2012).

It is easier to criticize other approaches to studying the impact of open data and qualifying them as “simplistic” than to develop a valid approach to studying it. Our approach to studying the dynamics of open data is based on theories about complex interactions in the public sector (Koppenjan and Klijn 2004; Teisman and Klijn 2008; Meijer 2013a). This study aims to contribute to our understanding of open data by acknowledging the complexity of societal dynamics and by taking a variety of values and desirables into account. Our analysis highlights that the construction and impacts of open data should be understood as emerging from a series of reactions of a variety of societal actors to open data and to each other’s reactions to open data.

Acknowledging the complexity of multi-actor interactions may be rather disappointing not only to the proponents of open data but also to the opponents. We argue against sweeping statements about the impact of open data and in favor of studying contextual interactions. We conclude that whether open data delivers its “promise” depends on these specific interactions that can be managed and controlled to a limited extent. Open data and its uses should be studied as social constructions that emerge over time in a specific context. A smart local approach based on designing arrangements for joint learning is the best we can aim for (cf. Koppenjan and Klijn 2004; Meijer 2013a).

This chapter will theoretically and empirically explore open data as complex societal interactions. The theoretical exploration is based upon literature in public administration about complex decision making and the empirical exploration is based on two Dutch cases. We will first position open data vis-à-vis related concepts such as freedom of information, transparency, and public sector information. Then we develop our own conceptualization and we will define it as a multidimensional concept. After this, we will elaborate on the issue of societal dynamics of open data

and argue that these dynamics can only be understood as contextual and emerging. We will present two case studies to indicate how our perspective can help to understand the construction and impact of open data. We will end the chapter with some conclusions and implications for both the study of open data and the practice of open data policies.

2 Open -Government Information: Historical Trends and Changing Concepts

There is much confusion in the use of terms that refer to governments making information available to society. The idea that government information should be available to all citizens arose in eighteenth century (Meijer 2013b) but, still, open government is now presented as something new and trendy. How can we position the current wave of attention in broader trends over time?

The dominant term in the 1800s was “publicity” (Bentham 1791). Publicity was a broad concept that did not focus on access to government information but stressed the public nature of meetings of representatives. The key reasons for publicity were to constrain representatives to perform their duty and to secure the confidence of the people in their representatives. Later on in the nineteenth century, the notion of publicity was used to push for access to treaties, legislation, and minutes of parliamentary meetings.

A stronger focus on access to government information only arose in the 1960s with the freedom of information act in the USA in 1966. Freedom of information had existed in Sweden since the end of the eighteenth century and Finland had adopted similar legislation in 1951 but the USA attention influenced legal debates worldwide. Information access laws were adopted in Australia, Canada, and several European countries in the 1970s and 1980s, and most countries around the world in the 1990s and 2000s (Roberts 2006; Erkkilä 2012).

Until the 1980s, freedom of information was the dominant term and this term was mainly used to refer to passive access to documents. Citizens could get access to documents at their own request. With the rise of new public management, the word “transparency” increasingly replaced freedom of or access to information (Roberts 2006; Grimmelikhuisen 2012). Transparency was much more about publishing documents online and making these proactively available to citizens. Another element of transparency is the emphasis on performance indicators and making these available to citizens and stakeholders through websites (Meijer 2007).

From the late 1990s onwards there was a growing emphasis on new concepts: public sector information (PSI) (Janssen and Dumortier 2003) and open government (Perritt 1997). Early versions of these concepts are different from transparency in the sense that they put more emphasis on datasets than on documents but they are still similar in the sense that democracy and the rule of law are the main objectives (Perritt 1997, p. 397). The term PSI is from the start not only used to refer to democratic objectives but also to economic benefits gained through reuse by both

Table 1 Shifting concepts of government information

Concept	Starting period	Features	Additional objectives
Publicity	Early 1800s	Proactive access, laws, parliamentary minutes	Democracy
Freedom of information	Early 1960s	Passive access, documents	Human rights
Transparency	Late 1980s	Proactive access, documents, data	Accountability, individual choice
Open-government and public sector information	Late 1990s	Proactive access, datasets	Collaboration, economic growth

multinationals and SMEs (Janssen and Dumortier 2003). These forms of use were also expected to spur open innovation and this was seen as crucial to the economic developments of countries. The new discourse also expands the scope of openness from only documents and indicators of government decisions and actions to scientific, environmental, and statistical information that is gathered and used by government but also potentially useful to other actors. Similarly, building upon president Obama's memorandum on transparency and open government in the late 2000s, the term "open government" is not only used to refer to transparency and participation but also to collaboration between government and society (McDermott 2010; Luna-Reyes and Chun 2012).

The development stages should not be regarded as exclusive. Current debates about open data also highlight aspects of democracy and human rights and analyze both access to datasets and to documents. The stages should be regarded as an expansion of previous concepts and as a focus on new aspects of the concepts. The current debate about open data is an expansion and renews the focus in the sense that there is much emphasis for economic value while this was hardly debated before in debates about publicity and freedom of information. In addition, these aspects do not always match. Janssen (2011) points out that regulations for access to open data may inflict upon freedom of information rights. The current tensions are nicely phrased in the subtitle of Aichholzer and Burkert's (2004) book on public sector information in an information age: between markets, public management, and citizens' right. Table 1 provides an overview of the shifting concepts of government information.

The changes over time can be understood in relation to technological developments from printing to photocopying to electronic storage to Internet access (Meijer 2009). The latest development, the focus on open government and open data, is closely related to the current wave of open and interactive technologies. A key feature of Web 2.0 is the emphasis on public availability of data, open standards, open platforms, open innovation, and open interactions (Harrison et al. 2012a, p. 901). Open data is a specific aspect of this broader "techno-philosophy" of openness.

3 Open Data as a Multi-Dimensional Concept

While the historical analysis of open government has provided insights in the origins of the concept, it is still not clear what we exactly mean when we talk about open data. From a naive point of view, one could assume that open data is mostly a technical issue: it refers to access to government information in electronic form (Perritt 1997, p. 398). Open data means changing the nature of information systems in the sense that (part of) these systems are connected to the Internet so that not only users within the organization can access the data but also users outside of it. The rapid technological developments have changed the costs of granting universal access dramatically and these technological opportunities could now be used to redesign information systems and grant universal access to data.

Technical access, however, is only one aspect of open data. Legal access is a second component. Various legal frameworks define to what extent data can be used and processed by other users. Government organizations may restrict legal access by emphasizing their copyright or they may stipulate that data can be used but not processed to generate new applications (Perritt 1997). Copyright law, intellectual property rights, and database protection may form important obstacles to open data but other legislation, such as the Paperwork Reduction Act in the USA, may drive open data.

Economic access and value is a third dimension of open data (Newbury et al. 2008; Vickery 2011). Data may be open for use but access may still be restricted if the user has to pay for access. Full economic access would mean that the data are made available at no cost and, in return, they can be used to develop applications that charge the users for their usage (Janssen and Dumortier 2003).

The last dimension of open data is the political dimension. This dimension refers to the fact that certain information may not be made available for political reasons. Political reasons may not only relate to unwelcome policy evaluations but also to access to information about certain citizen groups or specific parts of the country may be restricted for political reasons. The political dimension may be more difficult to measure than the other dimension since it refers to “coloring” the information (Grimmelikhuijsen 2012). How can we observe that data are “massaged?”

The four dimensions of open data and the relevant questions for these dimensions are summarized in Table 2.

On the basis of these four dimensions, we present the following definition of open data:

Open data means that government data are technically accessible for use by citizens and stakeholders without legal, economic, or political restrictions.

It is important to realize that open data is not a dichotomous concept: data can be open in certain dimensions and to certain degrees. Government organizations may choose to make certain data available at limited cost. This generates more openness than before but is still far away from complete openness.

Table 2 Dimensions of open data

Technical access	Can everybody access the government data or is access restricted? Are the data available in a machine-readable format so that they can easily be used in applications?
Legal access	Is everybody allowed to use the data for their own purposes or are there restrictions to use? Are citizens, stakeholders, and companies allowed to process and (re)publish the data?
Economic access	Are the data available at no cost or do people have to pay to access the data? Are citizens, stakeholders, and companies allowed to make a profit out of open data?
Political access	Is access not limited to politically desirable issues or does it entail all issues? Have the data not been “massaged” to avoid political sensitivities?

Now that we have indicated what open data is, we can now present our perspective on the role of open data in relations between government and societal actors. How can we understand why open data initiatives are being developed and what form they take? How can we describe and analyze patterns of usage of open data? What are the effects of this usage and are these effects desirable?

4 Societal Dynamics

The perspective on open data that seems to underlie much of the literature is the following (e.g., Perritt 1997):

- Government organizations create open data to attain various policy objectives such as economic growth, better individual choices, and more accountability
- Societal stakeholders use the data to construct new applications and to interact with government and other actors in the public sector
- These new applications generate collective desirables such as wealth and participation

We feel this argument is flawed because it ignores the political context of open data (who gains and who loses?) and it conceptualizes the application of open data as a commodity rather than an artifact that acquires its meaning in processes of sensemaking in political systems. Harrison et al. (2012a) acknowledge the need for a richer perspective on open data and, building upon Nardi and O’Day’s (1999) seminal work on information ecologies, they present the idea of an open-government

ecosystem. This perspective stresses interdependencies between the various actors, feedback loops, and variety of information resources. The instrumentality in much of the literature is challenged and replaced by a more holistic perspective on open data interactions.

We follow Harrison et al.'s (2012a) idea of analyzing complex interactions between various actors and propose to use theories of complexity to analyze the interactions within these ecosystems more specifically. Theories on complex decision making teach us that the emergence of open data should not be studied as a process in which one actor—a government organization—takes a decision about open data based on rational arguments. Political decisions emerge from interactions between actors with different interests, different sources of power, different perspectives on the public sector, and different interpretations of institutional rules (Koppenjan and Klijn 2004). Government decisions, especially those that have important implications, result from internal and external dynamics in which a variety of stakeholders try to put an issue on or off the agenda, influence the decision premises and influence the actual implementation of the decision. The construction of open data should be understood as the outcome of multi-actor and multilevel “games.” Meijer (2013a) highlights that these games are about power, information and rules and can be analyzed from a strategic, cognitive, and institutional perspective.

These “games” do not end with the construction of open data but continue in the sense that proponents will push for more open data or more openness along the other dimensions while opponents will make an effort to limit open data. Perceptions of impacts of open data play an important role in subsequent debates and proponents will try to highlight the positive effects while opponents will do the opposite. Framing open data is crucial to these interactions. Frames may create clear lines between proponents and opponents but through forms of “frame reflection” different stakeholders may be able to engage in forms of joint learning that can help them to construct forms of open data that are acceptable to both sides.

The starting event is the release of open data by government in response to pressure from internal or external actors. This event is complicated in terms of the number of actors involved but this single game could theoretically be mapped in terms of strategies and outcomes. The complexity increases considerably because actors start reacting to this event in various unpredictable ways. And complexity increases even more because actors react to each others' reactions. In sum, the starting event triggers a series of reactions and these trigger new reactions, and so forth. Second, third, and even fourth order effects render the outcome of open data highly unpredictable.

Our alternative model to studying the societal dynamics of open data is the following:

- Government organizations and stakeholders have a variety of interests and perspectives on open data
- All these actors engage in interactions in which they try to influence the sociopolitical construction of open data

- These interactions take place in various “rounds” (Teisman 2000): practices and impacts are framed and reframed
- The practices of both governments and stakeholders emerge in path-dependent (and therefore unpredictable) ways from these interactions

In the following section we will present two case studies that show the value of our perspective on the dynamics of open data.

5 Illustrative Case Studies of Open Data Dynamics¹

Open Data in Public Transportation

Public transportation is an important domain for debates about open data. In some cities, such as London, the departure times of public transportation are available real time. The availability of this data enables the development of apps that can suggest alternative routes based on information about delays. This illustrates that open data about public transportation is an example of data that has direct value for individual choices of a large group of citizens.

The publication of data about public transportation has a (relatively) long history in the Netherlands. In 1992, the government funded the creation of the public transport information service 9292ov by a group of public transportation companies. For a long time, this has been the only provider of this information and users had to pay for this information when it was provided over the telephone. The information is now freely available on a website but there are still important limitations. It provides real-time information only of trains and not of other means of transportation. For this reason, in 2006 a new initiative called GOVI was developed to provide real-time information about other means of transportation.

In 2009, the minister of transportation reacted to the demand for real-time information and introduced a plan to present full, real-time information to all travelers through a National Database Public Transportation. One of the added values for the minister is that the database can be used to check whether public transportation companies are as punctual as they have promised in their contracts with government. He reserved 30 million euros to develop this database. Parliament wanted the minister to ask 9292ov to develop it but the minister responded that it has to be an open bid procedure. Therefore, the minister decided to develop two databases: one about trains and one for other means of transportation. The idea is also that these

¹ The objective of the case studies was to illustrate the relevance of the argument about societal dynamics. Data for these illustrative case studies were collected in the period May 2012–May 2013 through a content analysis of websites. Much information about these initiatives is available online (as can be expected of open data). Initiatives that were relevant for these domains were selected through a search on the Internet and contacts with key informers. We used the model of the societal dynamics of open data to analyze the data. Follow-up in-depth research through interviewing is needed for a thorough reconstruction and understanding of these dynamics.

databases will be connected to a National Database Road Traffic to provide citizens full information about transportation. These developing plans enhance complexity and full, real-time open data have not been realized yet by the minister.

At the same time, three youngsters of age 14 and 15 years old have managed to realize real-time information about the buses of Connexxion (one of the largest public transport companies in the Netherlands). They contacted Connexxion and asked for the information and Connexxion then contracted the company of the youngsters to develop the app. This app is now freely available in the app store. Later, Connexxion started to cooperate with 9292ov: information about trains is now also available through the app and 9292ov contains information about the Connexxion buses.

The case illustrates the various components of our model:

- Government organizations and stakeholders have a variety of interests and perspectives on open data. Various actors, government, public transportation companies, providers of information, public transportation lobby groups, and even individual (young) citizens interact in the construction of open data. They have a variety of commercial and public interests. Government has a variety of interests such as providing information to citizens but also stimulating them to travel with public transport and, even more interestingly, public accountability. They can use the data to check whether public transportation companies are as punctual as they have promised in their contracts with government.
- All these actors engage in interactions in which they try to influence the sociopolitical construction of open data. These actors interact in the sociopolitical construction of open data. 9292ov tries to protect its monopolistic position in the provision of this data but the minister of transportation is influenced by the GOVI initiative to provide real-time open data. In his policy choices, he is influenced by parliament and legal restrictions but then a new initiative by a group of youngsters leads to new debates about the possibility to provide this data.
- These interactions take place in various “rounds”: practices and impacts are framed and reframed. A first round took place in 1992 when government supported the creation of 9292ov public transportation information services. It was quiet for a long time but things were stirred up by GOVI in 2006. An important new round took place before and after 2009 when the minister developed and redeveloped his policy for providing public transportation data. A last round of interactions has been started by three youngsters who acquired the data from a bus company.
- The practices of both governments and stakeholders emerge in path-dependent (and therefore unpredictable) ways from these interactions. The monopolistic role of 9292ov can only be understood as a decision taken in the context of the early 1990s and local reactions such as GOVI and the initiative of the three youngsters were highly contingent. From a rational choice perspective, one cannot understand why government just does not demand that 9292ov releases the data but the complex societal interactions highlight why this construction is unpredictable.

Both the progress and standstill of the development of open data in public transportation cannot be understood from the naive model: This case highlights that we need to analyze complex multi-actor interactions over time to understand how open data came to be constructed and reconstructed over time.

Open Data in Policing

Citizens are highly interested in information about crime in their neighborhood. This information is less directly connected to citizen choice than information about public transportation although it can be used in the choice for buying or renting a house. The value of this information lies more in informed debate about public safety. Citizens can use the information to push for better safety in their neighborhoods by contacting the police, politicians, or media.

The police in The Hague have a website that presents a crime map: hoeveiligismijnwijk.nl (“How Safe is my Neighborhood?”). The data come from the national police registration system for crime and the website was developed in 2006 and renovated in 2011. For privacy reasons, this information is not presented at a lower level of aggregation. It is possible, however, to search for information on the basis of year and month to obtain an idea of the development over time. It is also possible to search for specific types of crime. Interestingly, the police do not offer the data as open data and therefore other stakeholders cannot develop their own applications. The reason for this choice seems to lie in the sensitive nature of the information and the risk that people may react too strongly to information about public safety.

More specific information is provided by the Utrecht police department through stopdecriminaliteit.nl (“Stop Crime!”). The origin of the data is the same national police registration system. Privacy seems to be less of an issue here since the exact crime locations are presented on the map. This crime map is both meant to obtain information from citizens about these crimes and to inform them about prevention methods. The idea behind the website was that citizens will be more willing to take preventative action when they see the actual level of crime in their neighborhoods. The Utrecht police department also does not make the data available as open data.

A third police initiative in the Netherlands was the crime map stopwoninginbraak.nl (“Stop Burglary!”). This website contained information about burglaries and requests to provide information. Interestingly, this website is no longer available. The reasons for ending the initiative are not known.

In addition to these crime maps, the police also release graphic information about crime—photos and videos—to get useful information about criminals. Depolitiezoek.nl is an app that presents information about crimes and asks citizens to come with information. The information comes from specialized systems for police investigations. This information is also controlled by the police and not made available as a data file for other stakeholders to develop their own applications.

At the same time, several commercial initiatives have been developed to present different kinds of safety information to the public. The website [112meldingen](http://112meldingen.nl) (“911

calls”) collects all alarm calls and provides this information on a website. Another commercial initiative is *misdaadkaart.nl* (“Crime Map”) which provides information about crime. The information is based on police press releases and presented at the level of streets. Press releases are analyzed automatically by search bots and the information is put into a database that forms the basis for the website. The website serves as an advertisement for the company behind it that specializes in helping companies to access “hidden” information.

The case illustrates the various components of our model:

- Government organizations and stakeholders have a variety of interests and perspectives on open data. Police, citizens, and commercial parties all have an interest in data about crime and public safety. The police are rather careful in publishing the information about public safety since they feel that this may lead to unwanted developments such as the further decline of a neighborhood with a relatively high-crime rate. Commercial organizations are interested in the data because they can use these to build websites that attract large groups of citizens and hence can be used to present advertisements. Citizens are generally interested in the information and feel they have a right to know but citizens who have been alleged with criminal acts or who have been victimized may feel that their privacy is being invaded upon.
- All these actors engage in interactions in which they try to influence the socio-political construction of open data. The police clearly try to control the “game” but they are increasingly pushed by commercial initiatives to present more open data. Interestingly, commercial initiatives such as *112meldingen* and *misdaadkaart.nl* manage to aggregate data from individual alarm calls and press releases and create new forms of open data. The information is not disseminated as open data but through individual releases but smart software can convert these into datasets. This shows that the capacity of the police to control open data is limited.
- These interactions takes place in various “rounds”: practices and impacts are framed and reframed. An interesting issue here is the issue of privacy and practices of privacy protection are shifting over time. The police present videos and photos through *depolitiezoekt.nl* and this practice has been criticized by privacy lawyers. Commercial initiatives such as *misdaadkaart.nl* generate a level of precision that exceeds the level that the police in The Hague choose by presenting the information at the street level and put aggregated at the level of the neighborhood. At the same time, we see that an initiative such as *stopwoninginbraak.nl* is withdrawn. There is no linear expansion, there is a trend towards more transparency of crime data but at the same time, there are also movements back to more opacity.
- The practices of both governments and stakeholders emerge in path-dependent (and therefore unpredictable) ways from these interactions. The police react to commercial initiatives and commercial initiatives react to police initiatives. Private initiatives such as *112meldingen* and *misdaadkaart.nl* put a pressure on the police to bring more data out in the open.

Again, the model can be used to analyze multi-actor interactions in a complex policy domain. The key conflict here is different from that in public transportation. The police are reluctant to open up the information for reasons of privacy and negative publicity while citizens feel they have a right to know and always have a high interest in crime-related information. Commercial parties exploit the public demand for crime-related information to build commercially relevant websites. The struggle here is about the best way to curb crime within the basic principles of law. Does that mean that everybody is to have access to crime data or can the police limit access for reasons of privacy or perverse effects?

6 Conclusions and Implications

Building upon theories about ecosystems (Nardi and O'Day 1999; Harrison et al. 2012a) and theories of complex decision making (Teisman and Klijn 2008), this chapter has presented a model to study and understand the complex interactions around the sociopolitical construction of open data. By applying this model to two empirical cases, we have shown the value of the model for analyzing these dynamics. The model highlights the feedback loops, the holistic nature of these interactions, the variety of information resources, the construction over time, the path dependency, the multi-actor interactions, the different interests and perspectives, and the emerging nature of open data.

What does our model mean for the empirical study of open data? This model highlights that we should be modest in our ambition to develop general knowledge about open data. It might be possible to identify patterns in a large set of cases but a search for general patterns may close our eyes to the relations that develop in specific situations. These specific patterns should not be considered as outliers but as interesting experiments that help us to learn about these dynamics. We propose a multi-method strategy where we try to enrich our understanding of open data by conducting both large-scale research and specific case studies. These types of knowledge product complement each other and they can both provide valuable insights for policy makers and society at large.

That brings us to the question of the social relevance of this research: How can this model be valuable for policy makers and society? We follow Harrison et al. (2012b) in their assertion that open government is not a good thing in itself but needs to be assessed in terms of public value realization. Our analysis highlights many similar points as Harrison et al. (2012a) but while they believe the ecosystems perspective also has prescriptive value, we believe in the power of an evolutionary approach. We think that policy makers should develop a diverse and heterogeneous perspective on open data. Van Gunsteren (2006) makes a distinction between two types of learning: instruction and variation and selection. The first type of learning assumes that there is one person that knows what we need to learn and learning takes place through experimenting while the second type of learning is based on an evolutionary perspective on change that stipulates the generation of variation and subsequent se-

lection of the best alternative. Van Gunsteren presents the evolutionary perspective as most fitting for ambiguous situations and we would argue that open data certainly qualifies as such. Our knowledge about these dynamics is limited and there is also much debate about the values at stake. Therefore, we think the principles of variation and selection can be most useful for policy makers that need to develop plans for open data.

Although the evolutionary perspective assumes a certain modesty of policy makers, it does not imply that decision makers cannot influence processes of change. When applied to issues of open data, they need to do four things:

- Ensure variation in open data initiatives and usage. Policy makers should stimulate diversity by making different types of open data available and actively stimulating diverse groups to use these data. They may stimulate government organizations to actively engage in arrangements with multiple private organizations to develop new forms of reuse (Veenswijk et al. 2012).
- Create selection mechanisms for open data initiatives. Policy makers can stimulate an environment that helps to select the most viable alternatives. They can do this by creating competitions for promising initiatives. Selection should not be based on numbers of visitors and generation of resources but on their contribution to the realization of public values.
- Ensure retention and dissemination of strong open data initiatives. These viable open data initiatives should be preserved in stable organizational and institutional forms by providing long-term funding and public support. Veenswijk et al. (2012) stipulate that there can be no open data sustainability without a sound learning environment.
- Steer open data initiatives indirectly. Policy makers can try to influence processes indirectly through knowledge exchanges, incentive structures, and stimulating conditions but they should not try to determine the outcomes of the complex societal interactions through formal mechanisms.

These evolutionary principles constitute building blocks for a strong public learning environment for open data. This evolutionary perspective acknowledges the complexity of open data dynamics and moves away from homogeneous approaches focusing only on linear relations between open data and public value. The emphasis on variation and selection helps to find nuanced and rich forms of open data usage that actually help to produce a variety of public values.

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Barriers and Development Directions for the Publication and Usage of Open Data: A Socio-Technical View

Anneke Zuiderwijk and Marijn Janssen

1 Introduction

During the last years, various studies have confirmed that opening data by public and private bodies has considerable potential to provide citizens, researchers, companies and other stakeholders with many advantages. Although opening data may have negative side effects (for instance, Bovens 2005; Kulk and Van Loenen 2012) and little evidence has been published proving that open data actually led to benefits (Blakemore and Craglia 2006), over the last years various studies have confirmed that opening data by public and private bodies might provide stakeholders with a growing economy by stimulating innovation and obtaining new insights in the public and private sector by creating new ways of understanding problems and interpreting data (for instance, Bertot et al. 2010; Blakemore and Craglia 2006; Charalabidis et al. 2011; European Commission 2003, 2011; Janssen et al. 2012; Zhang et al. 2005). Nevertheless, the process in which data are created, published, found, used and discussed, which we refer to as the open data process, is complex, dynamic and heterogeneous for several reasons. First, the open data process is complex, dynamic and heterogeneous because many stakeholders outside as well as inside public administration are involved in this process. These stakeholders perform different activities, in various, non-standardized ways (Zuiderwijk and Janssen 2013a). The process is usually divided into different parts that are treated separately by open data providers and users, which means that open data providers or users who are involved in one part of the open data process are often not involved in other parts, resulting in little interconnectivity between their activities. The process is complex because one cannot predict how open data are going to be used in the future and because various contexts play a part in the open data process, such as legal contexts

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(Kulk and Van Loenen 2012) and cultural contexts (Nugroho 2013). Finally, the open data process is heterogeneous because organizations produce different types of data that are treated in different ways (for instance, see Kalidien et al. 2010 for an example about crime data). These characteristics of the open data process complicate the supply and use of open data. The barriers of the open data process should be taken into account in developing open data infrastructures.

At this moment, many open data infrastructures as well as providers and users of open data do not take these complexities and dynamics and this heterogeneity of the open data process into account while performing their activities in it. As a consequence, the potential of the open data process is not fully exploited. For instance, open data barely support policy-making and decision-making by policy-makers, because open data publishers often do not profit from the wisdom of the crowd by having government data reused by external users and gathering feedback from them (Zuiderwijk and Janssen 2013a). Furthermore, no extensive overview is available of barriers for the open data process that considers these characteristics from a socio-technical view. *Socio-technical view* refers to taking into account the technical system as well as the social system (Fischer and Herrmann 2011). The basic idea is that the interaction between social and technical factors influences the outcomes (Bostrom and Heinen 1977; Vonk and Ligtenberg 2010), which is in our situation the open data process. This chapter aims at answering the question about (1) which socio-technical barriers exist in the open data process and (2) which development directions could be derived from this overview of barriers. We take a socio-technical perspective as we expect that barriers in both the technical and the social areas influence the performance of the open data process.

According to Fisher and Hermann (2011), technical systems are ‘engineered to provide anticipatable and reliable interactions between users and systems’, whereas social systems ‘are contingent in their interactions and a subject of evolution’. Socio-technical systems contain computers, networks, and software (technical), and humans, human behaviour, procedures, policies, laws, organizational structures and processes surrounding the development, use and maintenance of these systems (social) (Fischer and Herrmann 2011; Geels 2004; Geels and Kemp 2007). An overview of socio-technical barriers could contribute to developing better open data infrastructures that deal with the complicating characteristics of the open data process and support the use and provision of data in the open data process.

The structure of this chapter is as follows. The approach for deriving an overview of socio-technical barriers is presented in the following section. Subsequently, the steps of an ideal open data process are presented and related to an overview of socio-technical barriers. Finally, the chapter is concluded by reflecting on the barriers and describing possible development directions for open data.¹

¹ This chapter builds on a paper that was written for and presented at the International Conference on E-Democracy and Open Government 2013 (Zuiderwijk, Janssen, & Jeffery, 2013) and has been extended and refined significantly.

2 Approach

The overview of socio-technical barriers is obtained by analysing various sources, because we expect that this provides us with a more comprehensive overview of barriers and suggestions for development directions than using a single source. We perform both qualitative and quantitative research, as this helps in deepening and widening our understanding of the topic for providing a practitioner's oriented framework (Olsen 2004). The used sources are as follows:

- Literature overview. Literature about barriers for open data infrastructures is obtained by searching for journal papers, conference papers, books, websites, reports and other information. Databases that were searched include Science Direct, Scopus, TU Delft Repository, Google Scholar and Google. Combinations of the terms open data, open government data, linked open data (LOD), public sector information (PSI), open data use, open data requirement, open data impediment, open data barrier, open data problem, open data restriction and open data challenge were used as keywords.
- Interviews. Six semi-structured interviews were conducted in various European countries to obtain more in-depth information about barriers for open data e-infrastructures. Experts who worked with (people who worked with) open data were interviewed. Some experts were data providers, some were data users. Interviews were conducted in December 2011 and January 2012 with people who mainly worked in social sciences and humanities disciplines, as no sufficient open data infrastructures exist in these disciplines. The interviewees were asked which types of open data they used, in which way, which impediments they noticed during their use, which challenges existed for the use of open data and metadata (i.e. data about the data, see Jeffery 2000; Schuurman et al. 2008). and what their requirements and needs were. All interviews were transcribed and the interviewees were provided with the opportunity to comment on the transcript, so that the transcript could be assimilated if there was a need for it.
- Questionnaire. A questionnaire about the use of open public sector data was developed to generalize the findings. The questionnaire aimed at obtaining information about the current state of using open public sector data. The questions with regard to barriers for the open data process concerned the extent to which a number of purposes were important for the respondents' use of open public sector data, to which extent the respondent was able to perform a large number of actions when using open data and to which extent the respondent found these actions useful. Moreover, questions were asked about metadata barriers. An online version as well as a paper version of the questionnaire was disseminated via many dissemination channels to obtain a large base of respondents in various countries. Approximately 300 people filled out a part of the questionnaire and about 50% of them filled out all questions. Although the questionnaire data do not allow for determining the exact distribution of respondents in different countries, the questionnaire was distributed in several countries (Austria, Netherlands, Greece, Norway, Belgium, Spain and the USA).

- **Workshops.** To obtain more information about which barriers exist for open data, four workshops were conducted at international conferences between May and September 2012 (International Conference for E-Democracy and Open Government, Annual International Conference on Digital Government Research, Samos 2012 Summit on Open Data for Governance, Industry and Society and IFIP—Electronic Government Conference). The goal of these workshops was to engage various open data users in different countries, as different users are expected to mention different barriers and the risk of invalid or country specific conclusions is decreased. The participants of the workshops were civil servants, academic and nonacademic researchers, students and companies.

Although the research was performed in various countries, in this chapter, we focus on the barriers that were found for the Netherlands. This is done because there are differences in barriers and in possible development directions among countries. Performing a cross-country analysis would be too comprehensive for this chapter. Moreover, different countries have different cultures (Hofstede 2001; Pollitt and Bouckaert 2011) and different contexts (Jetzek et al. 2012), which could influence barriers and development directions for open data. For these reasons we focus on one country.

3 Overview of Socio-Technical Barriers

In this section, we discuss the socio-technical barriers that were gathered with the literature review, interviews, workshops and questionnaire. The barriers are discussed on the basis of what we refer to as the open data process, which is the process in which data are created, opened, found, analysed, processed and discussed and provided feedback on (see Fig. 1). The creation of open data can take place in various ways, such as by producing, collecting, storing and paying for data. These created data can be opened by publishing them on the Internet, so that they can be found by potential open data users. Subsequently, the data that are found can be analysed (for instance, by performing a statistical analysis) and processed (for instance, by visualizing and linking data). Data that have been reused can be discussed by open data users and open data providers. In this way, open data providers obtain feedback on their data and on the information that can be derived from the data. For example, open data providers can use the wisdom of the crowd to improve their policies and decision-making processes. On the basis of the feedback that they can gather from external users of their data, they can also adapt the way that they create and publish open data, so that the data become more easily reusable by potential open data users. In this way, they take into account the needs of the users of their data.

We elaborate on these six steps of the open data process and the related barriers in the following sections.

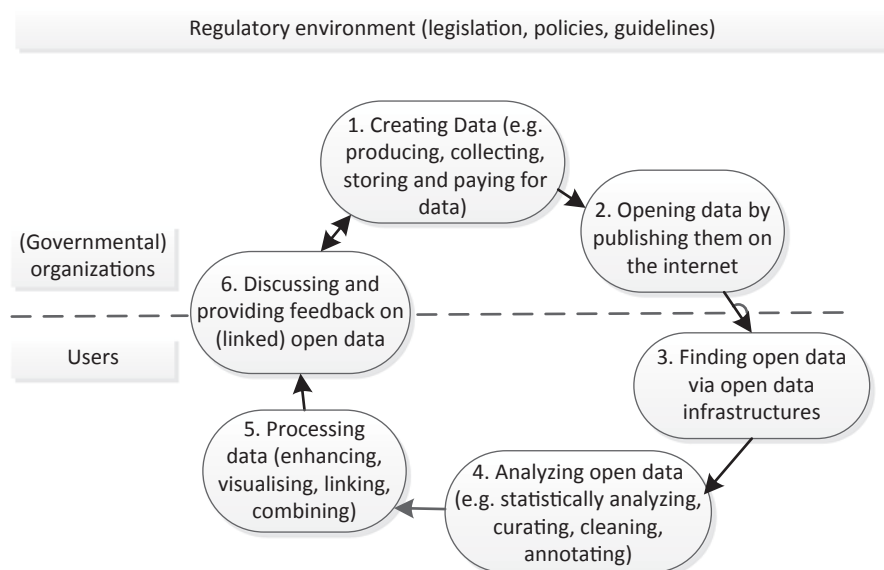


Fig. 1 High-level representation of the open data process. (Derived from Janssen and Zuiderwijk 2012; Zuiderwijk et al. 2012c)

Barriers Related to the Creation of Data

The first step of the open data process concerns the creation of data by employees of public organizations in the daily course of their activities. When data are already created, it is important to pay attention to a number of aspects, as this could make it easier to perform sequential steps in the open data process. Not paying attention to these aspects may result in barriers for data use; for this reason it is important to pay attention to them in open data policies. First, data creation needs to be highly related to data publication. During the creation of data, the possibility of publishing them afterwards needs to be taken into account, but the publication of data is usually not an integral part of the data collection or creation process, as it is usually viewed as a separate activity (Zuiderwijk and Janssen 2013a). For example, the creation of appropriate and sufficient metadata needs to be taken into account while creating data. However, one very important barrier is that usually insufficient metadata are created and provided (Schuurman et al. 2008; Xiong et al. 2011). Those metadata that are created are usually unstructured and difficult to understand (Dawes 2010). A lack of appropriate metadata limits the possibilities of publishing and using data (Zuiderwijk et al. 2012b), which was also confirmed by the questionnaire results. Approximately three-quarters of all respondents of the open data questionnaire stated that they used metadata. The majority of the respondents stated that metadata always make reusing data, interpretation of data, searching and browsing data and linking data easier. However, these benefits are often not obtained from the use of

metadata, as several problems are noticed. Often there are insufficient metadata and therefore it is difficult to interpret the data, also often there are insufficient data about the data quality, data gathering and measuring, and often they have no structure and are therefore difficult to search and browse.

Metadata are also important to assess the quality of data (Batini et al. 2009) although the interviews showed that assessing the quality of open data is very difficult at this moment. Even to the data providers what the quality of the data is might be unknown. Different purposes of open data many also require different levels of quality. In addition, the datasets are published to serve one goal, but they may not be sufficiently comprehensive for another goal. Data providers are usually unaware of the needs of open data users and they do not know in which way they should take these needs into account while creating data. Furthermore, data providers usually do not get any support for creating data in such a way that the data can easily be used in the open data process. In the Netherlands, legal frameworks, policies and guidelines are often inappropriate to support the creation of open data as part of the open data process (Nugroho 2013).

Barriers Related to the Publication of Data

The publication (i.e. opening) of data refers to the second step of the open data process. Public organizations increasingly decide to publish (some of) the data they created on the Internet (Geiger and Von Lucke 2012; McDermott 2010; Meijer and Thaens 2009), which can also be concluded from the growing number of datasets on open data portals such as data.gov and data.gov.uk. A license can be used as a condition for the publication and use of the data (Bunakov and Jeffery 2013; Kaas-enbrood 2013). These data are then referred to as open data. Not all organizations are willing to publish their data on the Internet (Nugroho 2013) and even if organizations are willing to publish their data, there are still many barriers that counteract the publication of data (for instance, Boulton et al. 2011; Kalampokis et al. 2011). The violation of privacy by opening data and of being legally liable when opened data are misused is an important barrier (Kalidien et al. 2010), which was also pointed out by the interviewees. Many public organizations do not know how their data are going to be reused and they do not know which problems this may cause. Moreover, they do not know what the value of open data is and what the needs of different types of open data users are. Open data users, such as citizens and businesses, may also be unaware of what the value of publishing data is.

Other barriers for publishing data may be that there is an embargo placed on the data, forcing that the data can only be opened after a certain period, the data are not (fully) owned by the organization that wants to publish them or the organization would like to (re)use the data itself. The way that data are published also influences possible barriers for using open data. To achieve large-scale use of open data, for many users the data should be published free of charge. Although certain users (e.g. businesses) might be prepared to pay for the acquisition of data, many users

(e.g. citizens) are not prepared to do this or they do not have the means to do this, and thus paying for data would counteract the use of open data (Vogel 2011). On the other hand, revenue systems of public organizations may be based on creating income from data, and thus this system needs to be changed to enable the open data process.

Another barrier refers to the provision of sufficient amounts of data, as this is required for users to find those data that they are interested in and enables the linkage of various datasets. Different types of users of open data are often interested in different types of data. Those users who want to develop applications on the basis of data are usually mainly interested in local real-time data, as real-time data provide users of the application with the most recent information, and applications often combine these recent data in a smart way, in this way thus providing services to users that could not be realized without the application. Journalists may be more interested in recent data, as they have to report interesting findings in media relatively quick. Other users may be more interested in less recent or historic open data on a national or international level, such as academic researchers or civil servants who want to investigate a certain development throughout decades. Certain users may also want to use data on a regular basis (e.g. for monitoring), but data are often not provided continuously or they are not updated (Kaasenbrood 2013). The type of data that users are interested in also depends on the intended type of use. For instance, mobile application on smartphones often use real-time data, while for longitudinal analyses time-series data might be more relevant. Open data providers usually do not take these needs of open data users into account.

Finally, the key objectives of open data policies reflect the ambitions of politicians. Politicians point to the public values that can be created by opening data to the public but without considering these complexities or finding ways to deal with the risks, while civil servants face the complexities and risks of making data open to the public (Zuiderwijk and Janssen 2013b). Not taking into account the complexities of privacy, transparency, security and trust in open data policies hinders the realization of public values (Meijer et al. 2013).

Barriers Related to Finding Open Data

The third step of the open data process refers to finding open data. Data that are published on the Internet can be found by (potential) users. Many types of data are not published. Those data that are published are published at numerous places on the Internet, which causes fragmentation and makes it difficult for potential users who want to find data on a certain topic to find these data (Kaasenbrood 2013; Lapi et al. 2012). These findings were also confirmed by our workshops. The questionnaire results showed that open data users find it difficult, as well as very important, to discover and browse datasets across local, national and international datasets in their own language. Although several websites provide an overview of which open data are available for reuse on which website (for instance, <http://datacite.org/repolist> and <http://www.narcis.nl/> and <http://opendatanederland.org/>), these over-

views are not complete. Users of open data often do not know which data are created by which organizations and open data platforms are usually not multilingual. Moreover, search possibilities on open data portals are often not advanced, which could result in not being able to find a certain dataset, even though the dataset is published on the website that one is searching (Zuiderwijk et al. 2012c). Open data infrastructures do not always provide clear interfaces that show the search possibilities and provide clear navigation.

The find ability of open data is not only a challenge on the side of open data users, but also on the side of the data provider. Making open data findable poses the challenge for different government organizations to collaborate. For instance, when data need to be published on one national open data portal, governmental organizations on different levels (e.g. the central, provincial and municipal level) need to collaborate and this process needs to be coordinated. The interests of these organizations might conflict, which makes it difficult to coordinate this process. Currently, there is much room for improving collaborations with other governmental organizations concerning open data, as this is not done very often (Zuiderwijk and Janssen 2013b). Finally, tasks need to be divided within governmental organizations.

Barriers Related to the Use (Analysis and Processing) of Open Data

The fourth and fifth steps of the open data process refer to the use of open data. More specifically, the use of open data concerns analysing and processing them. Merely the person who searches for open data and who is able to find them, can download them. As we stated before, usually only few metadata are provided with the data, which makes it difficult to understand the context in which they were created and to interpret them (Schoorman et al. 2008; Xiong et al. 2011). Our workshops showed that in case that insufficient metadata are created and they are not laid down in the form of data, the dataset cannot be reused properly. The data that are published are usually not published in a format that makes it easy to reuse the data, such as a format that enables machine readability.

The results of our questionnaire showed that open data users find it difficult to process data by linking them to other data. This is understandable, because most open data are published on the web in a proprietary format (Braunschweig et al. 2012), but usually not in a non-proprietary format, according to RDF standards or according to linked RDF standards (levels three to five of Berners Lee's (2009) five star model). However, open data obtain more value when they are linked compared to open data that are not linked (Berners-Lee 2009).

The workshop participants emphasized that before an open data user decides to use a dataset, he or she wants to obtain information about the quality of the data. The definition of data quality depends on a person's background. Certain open data can be of very good quality for the purposes of one person, but may not be good enough for the purposes of another person. At this moment, often no information about the quality of the data is provided and users have to find out themselves what

the quality is and what the value of the data is. Often, users lack skills, capabilities and knowledge to do this and to use the data. Usually no support or help or training for the use of the data is provided. Furthermore, many open data infrastructures do not provide appropriate tools which make it easier to use open data. For instance, they do not provide tools for collaborating with other users or for asking questions to the data provider or other data users.

Barriers Related to Discussing Open Data and Providing Feedback on Them

The sixth and final step of the open data process shows that open data can be discussed and feedback on them can be provided. An important barrier in the current open data process is that this final step is barely realized. The questionnaire showed that open data users mainly have difficulties with (1) providing feedback to the data producer by putting needs for open public sector data, (2) providing feedback on the data by rating the data (e.g. rating the quality of the data) and (3) getting training on the use of open public sector data. The data provider that released the dataset usually does not discuss it with users or obtain their feedback on the dataset to improve its own processes (Janssen and Zuiderwijk 2012; Zuiderwijk and Janssen 2013b). Usually no easy-to-use tools are provided to monitor who the users are of the data and how the data are used exactly. It is unclear to open data providers which data or types of data users need. Another user barrier concerns the lack of possibilities to discuss open datasets in a discussion environment that is devoted to a certain dataset and in which data providers and data users can collaborate or ask questions (Zuiderwijk and Janssen 2013a). It is difficult for governmental organizations to find users of their data, and at the same time it is difficult for users to find government organizations and to participate in discussions about open data (Böhm et al. 2012). Finally, open data providers usually do not have appropriate processes for dealing with user input derived from open data reuse. There are no mechanisms for ensuring that results of open data use are considered by the government.

Summary of Barriers

In the previous sections, many barriers for the open data process were presented. Table 1 summarizes these results and proposes which barriers could be viewed as technical barriers and which barriers could be viewed as social barriers. We acknowledge that dividing the barriers into the categories of technical and social barriers is subjective. Some barriers can be both technical and social. For example, information quality can be viewed as a technical barrier, i.e. the quality of the information in the system should be fine, but information quality influences the use of the data and could complicate their interpretation which can be considered as a more social aspect.

Table 1 Summary of the potential technical and social barriers of the open data process

Step	Technical barrier	Social barrier
Creating data	System quality	Quality of the data source is unknown
	Few metadata created	Metadata are difficult to understand
	Metadata are difficult to understand	Datasets are not sufficiently comprehensive
	Unstructured metadata created	Inappropriate support for data creation (e.g. lack of policy, legal framework and guidelines for data creation)
	No open data publication support	Not being aware of the needs of open data users
		Not considering the needs of open data users in the way of creating data
		Not knowing how to integrate data creation in the process of systematically publishing open data
		The process of creating data is highly related to data publication
		Risk averse attitude and resistance towards opening
Publishing data	Insufficient data published (amount and type)	Embargo period, data deletion policy or organization wants to reuse data itself
	Data are not published continuously or not updated	Fee charged for data use (revenue system based on creating income from data)
	License restricts data publication and/or use	Risk on privacy violation, legal liability, data misuse and criticism
		Unclear how data can be published. Insufficient guidance of open data policies about how to deal with complexities and risks of opening data
		Not willing to publish data
		Unclear how data will be reused in the future
		Unclear value of open data
		Not being aware of the needs of open data users
		Not considering the needs of open data users in the way of publishing data
		License restricts data publication and/or use
		Many types of uses to consider
Finding data	Fragmentation: data published on various websites	Users often do not know which organization creates which data
	Overviews of which data can be found where are insufficient	Organizations need to collaborate to make data findable
	Lack of clear interfaces (searching and navigation)	
	Data are not available/published	
	Open data platforms are usually not multilingual	

Table 1 (continued)

Step	Technical barrier	Social barrier
Using data (analysing and processing)	Semantic interpretation is complicated	Difficult to understand the context in which data were created
	Format restricts data use	Difficult to interpret data
	No information about the quality of the data	Users have to find out themselves what the quality and value of the data is
	Insufficient tools for using open data	Lack of skills, capabilities and knowledge to use the data
	Lack of tools for collaboration with other users or for asking questions to the data provider	No support and/or help and/or training for the use of the data is provided Difficult to collaborate with other users
Discussing data and providing feedback on them	Lack of tools for monitoring feedback, data use and data users	Data providers and data users do not discuss datasets Few incentives for participation
	Lack of tools and instruments to discuss open datasets in a discussion environment that is devoted to a certain dataset and in which data providers and data users can collaborate or ask questions	Data providers and other governmental organizations often do not use feedback on datasets to improve their own processes (e.g. policy-making) Often not being aware of the needs of open data users Often not considering the needs (e.g. data requests) of open data users Usually no process for dealing with user input

The open data process is hindered by technical as well as social barriers. For instance, many barriers refer to people, policies, procedures, law (social), as well as computers, infrastructures, networks and software (technical). The interaction between the participants of the open data process (e.g. open data providers and users) on the one hand and the technology on the other hand shows the importance of adopting a socio-technical view on the open data process, rather than just a social or just a technical perspective. To be able to realize the benefits of open data, open data infrastructures as well as actors in the open data process should consider both social and technical barriers for the open data process and provide an integrated approach to successfully counteract these barriers.

Table 1 also shows that activities early in the open data process could result in barriers or in an increase of barriers later in the process. For example, not including metadata in the publication of data, results in barriers for users who want to make use of the data but are left without any knowledge about the possible use. Furthermore, publishing data without ensuring quality can result in the situation in which users find out that the quality was not suitable for their purposes after they have reused the data. This shows the need for taking an integral approach, in which the social and technical barriers are dealt with, simultaneously. Only when both the social and the technical barriers are dealt with, the benefits of the open data process can be realized.

4 Possible Development Directions

In this section, suggestions with regard to development directions are provided about how we can possibly deal with the identified barriers. A socio-technical view is adopted.

Development Directions Related to the Creation of Data

An important suggestion for improving the creation of data concerns the provision of metadata. Metadata are key enablers for the effective use of open data later in the open data process (Dawes and Helbig 2010). For example, metadata may help to create order in datasets by describing, classifying and organizing information (Duval et al. 2002; Zuiderwijk et al. 2012a), which makes it easier to interpret data. Preferably, employees of public and private organizations create metadata that are machine-readable to stimulate interoperability with other data and metadata. Machine-readable structured metadata make it possible to assist in multilinguality and multimedia representations, in this way stimulating international comparative research and collaboration between stakeholders in the open data process (Hüner et al. 2011; Jeffery 2000; Zuiderwijk et al. 2012b).

Development Directions Related to the Publication of Data

Our interviews revealed that the publication of data might be improved by better informing open data providers about the risks of opening data. Information may be provided about which datasets can be published and which cannot be published (for example, provide a framework that helps identifying privacy sensitivity). In addition, more awareness of the advantages of open data can be created by (1) providing an overview of examples for different organizations showing what the benefits of providing data are, (2) providing tutorials stating for which purposes certain datasets can be reused, (3) providing examples of use cases for certain datasets and comprehensively showing how the use case can be realized by other users as well and (4) providing examples of business cases for certain datasets. This could be done by maintainers of open data portals, in collaboration with the users of those portals, to stimulate organizations to publish their data. Furthermore, the workshops showed that the publication of data can be improved by taking into account the preferences for certain types of data for certain open data users. The way that data can be used, the users to who the data could be interesting, and, in relation to this, the open data portal on which the data are published are important to consider when publishing public data.

Development Directions Related to Finding Open Data

The workshops pointed at the importance of searching for open data. To improve the ability to find open data, a search functionality with advanced search fields might be provided by open data infrastructures. This search functionality could make it possible to search through metadata of many datasets. We suggest open data infrastructures to enable searching through flat discovery metadata (identifier, title, creator, publisher, country, source, type, format, language, sector, subjects, keywords, relative information system, validity date, audience, legal framework, status, relevant resources and linked data sets), contextual metadata (organizations, persons, projects, funding, facilities, equipment, services and pointers to detailed metadata) and detailed metadata (quality accuracy, precision, calibration and other parameters (Charalabidis et al. 2011) and domain or dataset-specific parameters that are used by software accessing and processing the dataset; Zuiderwijk et al. 2012b). For this purpose, considerable metadata need to be provided by the data publishing organization.

Additionally, the workshops showed that it could be beneficial if open data providers create overviews showing which types of data they create in general and which datasets they create in particular, even if those datasets are not published on the internet. Such an overview could help users to find those data that they need and to become aware of the organization that creates them, so that they can contact these organizations to search for possibilities of publishing certain data and for questions or discussion. Furthermore, it could help data providers to become more aware of the work that is performed and the knowledge that they have about certain data in their own and in other organizations, in this way stimulating collaboration within and between organizations.

In addition, a good strategy for dealing with Uniform Resource Identifiers (URIs) could make it easier to find data. URIs can be defined as ‘short strings that identify resources in the web: documents, images, downloadable files, services, electronic mailboxes, and other resources. They make resources available under a variety of naming schemes and access methods such as [Hypertext Transfer Protocol] (HTTP), [File Transfer Protocol] (FTP), and Internet mail addressable in the same simple way’ (World Wide Web Consortium 2006, <http://www.w3.org/Addressing/>). For instance, the URI strategy of the World Wide Web Consortium (W3C) can be followed (see <http://www.w3.org/Addressing/>).

Furthermore, search directions could be shown on the home page and could link to parts of the website where users can obtain information about search possibilities and support for searching open data. Support could include the possibility to state which open datasets would be interesting to use in case these datasets are not available on the Internet. The request for certain datasets could be linked to data providing organizations. This may improve navigation.

Finally, to make it easier for users to know where they can find open data and to give them the confidence that they can use the platform in the future, it is important that open data platforms are sustainable, as it was pointed out during the workshops.

Open data platforms should provide easy access on a daily basis and be reliable in terms of accessibility of the website, response times and quickly loading pages. If open data users do not have confidence in a certain open data portal, they will probably not look for data on that portal again.

Development Directions Related to the Use (Analysis and Processing) of Open Data

In addition to downloading the data themselves, using open data can be facilitated by providing the possibility to download the metadata, as metadata can help in using open data, for instance by creating order within datasets by describing, classifying and organizing information (Berners-Lee 2009; Duval et al. 2002; National Information Standards Organization 2004), improving easily, analysing, finding patterns, comparing, reproducing and finding inconsistencies in LOD (King et al. 2011; Taylor 2003; United Nations Statistical Commission and Economic Commission for Europe 2000) and providing a context for using data to improve chances of a correct interpretation of open data and distilling knowledge from them (Foulonneau and Cole 2005; Jeffery 2000; Schuurman et al. 2008; United Nations Statistical Commission and Economic Commission for Europe 2000; Vardaki et al. 2009). Metadata can also describe the quality, accuracy and completeness of the dataset. In addition to metadata, knowledge about the quality of the data can be acquired from a distribution of ratings of different types of quality by previous users of the dataset and from other feedback of previous users (e.g. posts). In addition, metadata and data that relate to well-accepted vocabularies and thesauri make the use of the data easier. Furthermore, the possibility to download data in different formats or to change the format of the dataset on the open data platform, may make the use of open data easier, as the type of use of the data may point at the use of a certain data format.

Datasets that are appropriate for use can be used in several ways.

- Use dataset by cleansing it. Data cleansing can be defined as ‘the process of detecting and correcting records in a dataset’ (Yaeli et al. 2012, p. 17). Data cleansing could be a goal itself, but is often performed to make it easier to use the dataset in another way, for instance by analysing it. If the dataset is cleansed, it becomes clearer to the user how the dataset can be analysed.
- Use dataset by analysing it. The questionnaire results showed that performing a statistical analysis was assessed as a very important reason to use open public sector data (by 44 % of the respondents). Analysing a dataset could merely mean reading (i.e. looking at) the dataset and deriving useful information from this activity, but it could also mean performing a thorough statistical analysis by using software. An analysis of a dataset might lead to new insights and understanding of the data, possibly by analysing data in a way that was not done before.
- Use dataset by enriching or curating it. Datasets can be enriched in several ways. For instance, a user could annotate a dataset by describing what he or she experi-

enced when using the data or which information other users should take into account when using the data. A dataset can also be enriched by adding information that was derived from the statistical analysis or visualization. Data curation is defined in different ways. Data curation refers to the management and promotion of the use of data, to ensure its appropriateness for contemporary purpose and availability for discovery and reuse (Lord et al. 2004).

- Use dataset by visualizing it. Visualizations often provide much more insight into a dataset than a normal data presentation. Therefore, it is useful to use open data by visualizing them. Nevertheless, one should keep in mind that visualization also makes it easier to interpret data in incorrect ways, as one may decide to visualize only a selection of the dataset, in this way excluding certain contextual information. When a dataset is visualized and published again, certain important information may be left out, leading to wrong conclusions.
- Use dataset by linking it to or combining it with another dataset. Linking or combining data can be done on different levels. Simple linking or combining could encompass merely referring to another dataset. On a higher level of linkage, datasets about the same topic from different countries can be compared. Various datasets could be integrated and turned into one dataset or the metadata of different datasets can be linked. The higher the level of linkage, the easier it becomes to understand to which extent data are comparable and to which extent the linked datasets are useful.
- Use dataset in another way. The before mentioned use activities are the most common ways of using open data. Yet, other ways of using open data are possible. For example, a person may only be interested in one metadata field that is provided with the data, such as the creator of the data or its funder, and uses the dataset to obtain this type of information.

It is important for open data infrastructures to support these types of use of open data. Open data infrastructures may provide tools to analyse, clean, and change the format of datasets, make it possible to easily obtain information out of statistical analysis, to generate automatic reports of statistical analysis and visualizations, to visualize data in tables, maps and charts, to link geo references to visualization tools, to obtain information about which analyses are relevant for the kind of dataset offered, to convert unstructured data to structured data and to link the raw data to publications or analysis reports of these raw data. Most open data infrastructures do not support all these use types.

Moreover, the workshops and interviews revealed that open data infrastructures can support the use of open data by providing tutorials and videos about the use of open data, provide examples of use cases and business cases for datasets, provide help and recommendations for the analysis and evaluation of policies and policy developments (for instance, an evaluation framework), provide a link for each dataset about relevant related open data policies, monitor links between data and make sure that they are still up to date, provide updates of datasets and inform users about when updates are going to be or have been published and provide a good judicial framework for the reuse of datasets, especially with regard to licenses.

The support of open data does not only have to be provided by the maintainers of the open data infrastructure but can also be taken care of by other users. For example, if an open data infrastructure provides a (market) place where open data users can collaborate with each other, support each other and work together in using open data. Another example refers to the creation of a personal website. If an open data infrastructure provides this possibility, open data users can send each other personal messages, which may result in collaboration. For example, users could find other users via the open data infrastructure, so that the infrastructure can serve as a place for finding project, business or sales partners.

After the open data have been reused, the open data infrastructure should allow for easily uploading the reused dataset. To make it possible for other users to obtain value from the derived dataset, it should be linked to the original dataset. It should be made clear to future users what the differences between the original and derived dataset are (i.e. version management). The open data infrastructure could provide the possibility for each dataset to subscribe to e-mail messages or other messages when a new version of a dataset has been uploaded. Easy uploading can be stimulated by providing clear instructions for uploading datasets and by creating direct links between the tools with which the data can be reused (for example, the visualization tools) and the tools with which the data can be uploaded. Finally, events such as hackathons, datathons, application programming competitions and other types of training can be used to stimulate the use of open data.

Development Directions Related to Discussing Open Data and Providing Feedback on Them

To be able to discuss open data and to obtain feedback from users, the possibility may be provided for open data providers to monitor who are the users of their data and how their data are used exactly. For instance, the interviews showed that data providers may be interested in analyses and applications that are based on their data, which may lead to new insights. The open data infrastructure may then provide tools to analyse what users do with open data. This analysis can be based on people that are registered and logged in and give permission to follow their actions. In addition, open data providers may be interested in the way that users rate their data, so that they can improve the way that data are created or they can improve their (open data) policy. For this purpose, open data infrastructure might provide rating systems and give open data providers the service to get regular updates about the ratings of their datasets. Open data providers should be able to obtain qualitative as well as quantitative feedback from monitoring feedback of open data users.

From the perspective of the open data users, open data infrastructures may make it possible to write down which data or types of data users need, as this may result in acquiring datasets that otherwise would not have been released. These data requests are easier to execute when the user knows from which organization and in which country the dataset could be gathered. In that case, the maintainers of the open data

infrastructure could send the data request to the organization that can provide the data. The ability to discuss open datasets in a discussion environment that is devoted to that dataset could be provided. Various types of users can participate in the discussion. Preferably, the data provider is linked to that discussion environment, so that users are able to discuss a dataset with the data provider and ask questions about the datasets or get other types of help.

5 Conclusions

The aim of this chapter was to present an overview of socio-technical barriers of the open data process and define development directions which could be derived from this overview of barriers. Socio-technical barriers were gathered with a literature review, interviews, workshops and a questionnaire. We found that most existing work only addresses social or technical aspects but not both. The barriers were discussed on the basis of six steps of the open data process, encompassing the process in which data are (1) created, (2) opened, (3) found, (4) analysed, (5) processed and (6) discussed and provided feedback on. Many barriers were identified in all six steps. In addition, it became clear that the six steps are highly interdependent, as certain behaviour in one step may highly influence the creation of barriers within another step. For instance, when only few types of metadata are published with the open data, it becomes very difficult for open data user to interpret and understand the data.

Furthermore, the analysis of barriers for the open data process showed that not only technical barriers can be found, but also social barriers and barriers concerning the interaction between social and technical factors. For instance, many barriers refer to people, policies, procedures, law (social), as well as computers, infrastructures, networks and software (technical). The interaction between the participants of the open data process (e.g. open data providers and users) on one hand and the technology on the other hand shows the importance of adopting a socio-technical view on the open data process, rather than just a social or just a technical perspective. Our analysis confirmed our expectation that barriers in both the technical and the social areas influence the performance of the open data process. We found a large number of technical and a large number of social barriers and both need to be overcome to benefit fully from open data. This shows the need for taking an integral approach, in which the social and technical barriers are dealt with simultaneously. In other words, to be able to realize the benefits of open data, open data infrastructures as well as actors in the open data process should consider both social and technical barriers for the open data process and provide an integrated approach to successfully counteract these barriers.

As a first step, several directions for further development of the open data process have been identified in this chapter. More research is required to evaluate to which extent these development directions will actually stimulate the open data process and which other development directions can be helpful. This could help in taking

open data strategies further and realizing the potential advantages. In addition, future research should focus on comparing barriers, success factors and development directions in different countries, as comparing barriers and development directions could show how different countries can learn from each other's open data strategies.

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Open Data: European Ambitions and Local Efforts. Experiences from Austria

Isabell Egger-Peitler and Tobias Polzer

1 Introduction

Europe's public administrations are sitting on a goldmine of unrealized economic potential: the large volumes of information collected by numerous public authorities and services.¹

Never before have public authorities been equipped with such an abundant supply of data, which is not only caused by, e.g., technical capabilities and social developments, but also by managerially induced public sector reforms. The stock of (digital) information is becoming even vaster and is rising exponentially, leading to the result that we are witnessing the age of “big data” (McKinsey 2011). More and more diverse groups are interested in the growing stock of data, among them both providers (i.e., states) and reusers (i.e., companies and the interested public)—may it be in the form of skeptics who worry about data privacy, or advocates who hype the potential of well-managed data. The latter move on to search for “goldmines” of unrealized possibilities, driven by the spirit of discovery and decoyed by the prospect of doing things that could not be done before. Thus, considering the variety of interest groups and their “territories”, the question arises as to how activities within the European Union (EU), at both supranational and national levels, are coordinated in order to unlock the (hidden) potential of public sector data.

¹ European Commission 2011d, p. 1.

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At supranational level, the European Commission is considered to be a strong advocate of the potential of public sector information (PSI)² and the “guiding light-house” of European data reuse: Already in 1998, the Commission identified PSI as a key resource for Europe (European Commission 1998). Most recently, its extensive ambitions to set free the potential of PSI resulted in the launch of the “open data strategy for Europe” because to date—and despite intensive efforts at the European level—“open data is largely undeveloped in Europe” (European Commission 2011d, p. 1). Hence, the European Commission argues from a very economic position—not least because this is its designated area of competency—and sees open data as a vehicle for innovation, growth, and transparency. Major benefits are identified in the reuse of public data, among others the creation of new products and services, and hence, according to the Europe 2020 strategy, the generation of jobs and growth (European Commission 2011a). The Commission presents itself in the role of the “good practitioner” and pursues a spirited and dedicated strategy for the reuse of PSI, while at national level, the topic is dealt with at quite different speeds and intensities. With a view to fueling more enthusiasm and thus more homogeneity among national ambitions, recent strategic efforts at European level and the proposal for a revised Directive on the reuse of public sector data (PSI Directive) have been geared towards more harmonization.

Given that the success of efforts at European level strongly depends on national ambitions, the quality of local implementation, and a certain degree of consistency, we pick up this pilloried incoherence between European and national ambitions in this chapter and examine whether, and to what extent, national open data ambitions are coherent with European strategies and measures and, if not, which other factors have a more determining effect. Fully aware that there is a variety of relevant lenses the topic can be discussed through (e.g., strengthening of transparency, accountability, privacy, public value, etc.), this chapter centers exclusively on the coherence of European PSI strategies and the corresponding national implementation activities, and conceives the open data topic from a “translation” perspective. In doing so, we draw on Austrian experiences to illustrate our points.

The chapter is based on an analysis of strategy papers and other relevant documents, direct contact to European Commission staff, and several interviews conducted with experts at Austrian federal level, within Vienna’s city administration and reuser side.³ The remainder of this chapter is structured as follows: In Sect. 2, we examine the strategic and legalistic measures and ambitions at European level and also sketch the European Commission’s expectations towards the member

² Public sector information is defined as “publicly funded information produced or collected by the public sector” (European Commission 2011b, p. 9).

³ Overall, six people were interviewed. Our interview guidelines drew on interesting aspects from the literature analysis but also emerging topics and local organizational specifics were considered. The interview partners came from different organizations: City of Vienna: CIO; Federal Chancellery: manager responsible for open data in the e-government department; Austrian subsidiary of a large ICT company: business developer; OPEN3 Association: board member; app programmers: two interviews. Each interview lasted between 30 min and 2 h and was tape-recorded when the interviewee agreed to this.

states and their role as “operators of goldmines”. Next, taking a national perspective (Sect. 3), we illustrate the ambitions on open data in Austria and give an overview of the status quo. Subsequently, in Sect. 4, we provide a deeper insight and focus on the open data strategy of the City of Vienna. Here, we seek an answer to the question of whether and to what extent developments at European level influence Austrian practices, and which other factors have an effect on efforts in Vienna towards open data. Sect. 5? concludes with a discussion of implications for a stronger strategic coherence with regard to PSI reuse.

2 Open Data Ambitions at EU Level: An Overview

The current strategic orientation of the EU is targeted at overcoming the financial and economic crisis with the ambition of creating conditions for a more competitive economy with higher employment. The underlying “Europe 2020 strategy” was conceptualized in order to “turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion” (European Commission 2010a, p. 5). In this context, smart growth also means making “full use of information and communication technologies and ensure that innovative ideas can be turned into new products and services” (ibid. 11). The benefits of a digital society should be exploited by policies which are committed to regional, national, and EU levels (ibid, see also European Commission 2010c). This priority was also adopted by the EU’s “Digital Agenda Initiative,” launched in 2010, which is the first of seven flagship initiatives of the Europe 2020 strategy. In this context, the digital agenda stresses the role of public authorities and mentions “governments can stimulate content markets by making PSI available in transparent, effective, nondiscriminatory terms. This is an important source of potential growth of innovative online services” (European Commission 2010b, p. 9). In order to enforce the reuse of already existing public data, and as part of the digital agenda, the European Commission presented the “Open Data Communication” in 2011 (European Commission 2011a). Therein, a package of measures and common standards is proposed in order to provide a better European (legal) framework for public data reuse. For this purpose, the open data strategy not only stresses the necessity of financing instruments in support of open data, as well as the communication between the member states; most notably, it is also accompanied by a proposal for a revised Directive on the reuse of PSI. Figure 1 gives an overview of the legislative framework for PSI (right column) and the underlying strategic documents (left column).

The proposal for a revised Directive on the reuse of PSI is considered an important component of the Europe 2020 strategy and the digital agenda for Europe. The 2003 Directive (2003/98/EC, based on European Commission 1998 and European Commission 2001) regulated the basic conditions concerning the reuse of PSI and addressed nondiscrimination, charging, licensing, and exclusive arrangements. Yet, the Directive only provided a minimum of harmonization and left it up to the member states to go beyond the minimum standards. The fact that only four countries

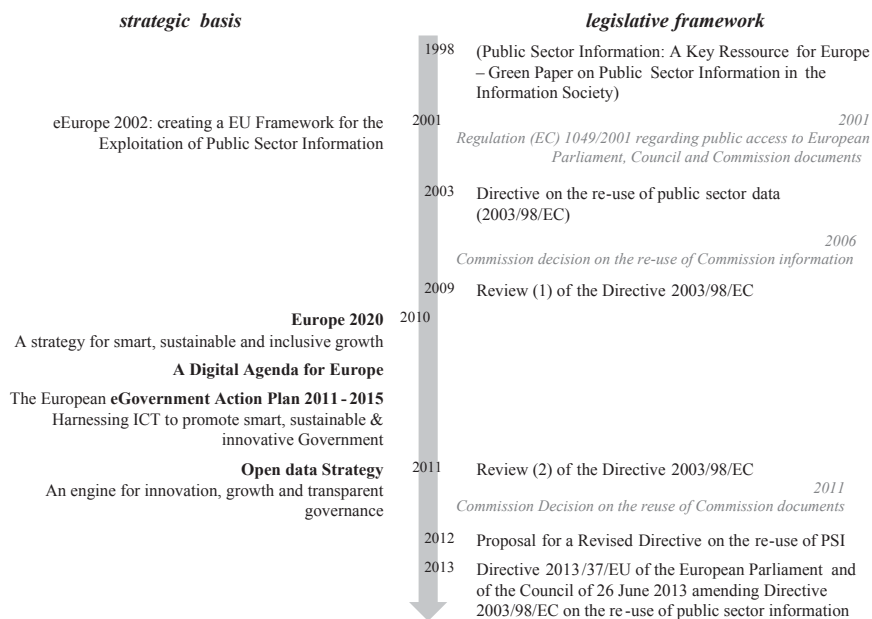


Fig. 1 Overview of PSI initiatives at European level, as of August 2013. (Source: Author's own)

met the 2005 deadline for national implementation—the Commission had to open 17 infringement cases—provides evidence for the skepticism of the member states towards a harmonization at supranational level (Janssen 2011). A 2009 review of the Directive (European Commission 2009), accompanied by a public consultation, revealed considerable deficiencies in existing legislation. The European Commission summarized that “both stakeholders and MS (Member States, the authors) indicate that the full potential of PSI reuse has not yet been realized. Public sector bodies lack awareness of their responsibilities and opportunities, and private companies have limited knowledge of their rights and the availability of PSI” (European Commission 2009, p. 6). While reusers argued in favor of a far-reaching revision of the Directive, member states adopted a hesitant position, especially with regard to the scope of the Directive. Due to the delay of implementation and the negative tenor of the member states, the Commission decided to carry out a further review. This review, conducted in 2011, is an essential part of the digital agenda (European Commission 2010b) and demonstrated that, although some progress was reported (web portals, price reductions, new legislation, etc.), barriers concerning the reuse of PSI still exist. The European Commission identified problems, such as insufficient clarity and transparency, unclear and restrictive licensing, lack of information on available data, locked resources, excessive charging, or incoherent approaches across the member states (European Commission 2011b). Against this backdrop, and especially due to the fact that the importance of open data has strongly increased since 2002 when the Commission made its first proposal for the Directive, the 2011 open data strategy goes hand in hand with a proposal for a revised Directive.

In its revised approach, the European Commission focuses on a packaged solution that consists of legislative amendments and corresponding soft law measures. Concerning the former, currently, a general right to reuse public sector data can only be granted if a public sector body has explicitly allowed this reuse. The new regulation, however, creates a genuine right to reuse public sector data: Member states are then obliged to deliver this data upon request (i.e., in principle, PSI has to be open and sensitive data has to be blocked actively). Concerning the scope of the Directive, the new regulation includes an extension and also covers museums, libraries, and archives, which ultimately supplies a mass of new information. There are also new charging rules which reject the zero cost option but instead leave it to the member states to decide whether or not they levy a fee (European Commission 2011e). Thereby, marginal costs should be the basis for the calculation of charges, whereas higher charges can be collected in certain cases (this is especially an issue for museums, libraries, and archives). According to the 2003 Directive, the burden of proof lies with the reusers to show that charging practices do not comply with the rules of the Directive. The proposal for a revised Directive includes a reversal of the burden of proof, so public sector bodies must demonstrate that their charges correspond with the charging rules of the Directive. The proposal of the Commission also intends that “the means of redress shall include the possibility of review by an independent authority that is vested with specific regulatory powers regarding the reuse of public sector information and whose decisions are binding upon the public sector body concerned” (European Commission 2011c, p. 16, see also European Commission 2011a). The proposal does not further specify the characteristics of such an authority. It remains to be seen how the member states react on the additional obligation due to the widening of the scope, the reversal of the burden of proof, and the call for an independent authority. In addition to these legislative amendments, some soft law measures (platforms, guidelines, recommendations, etc.) are proposed. Recommendations concerning licensing provisions, technical formats or price calculations can be the subject of such accompanying soft law measures. In order to encourage coordination and sharing of experiences, the “PSI-Group”, a group of national experts for the exchange of good practices, was set up, as well as the “PSI Platform”⁴. The latter is an online platform that is primarily an information network, but it also functions as an important soft-law tool, not least because it also includes the so-called “PSI scoreboard” (a ranking based on the assessment of the reuse situation in the member states).

In addition, EU member states are expected to formulate national open data policies and to orient towards European good practices. The European Commission itself wanted to set a good example and presented a revised “Commission Decision on the Re-Use of Commission Documents” in 2011 wherein it argued that “[a]n open reuse policy at the Commission will support new economic activity, lead to a wider use and spread of Union information, enhance the image of openness and transparency of the Institutions, and avoid unnecessary administrative burden for users and Commission services” (Official Journal of the European Union 2011,

⁴ <http://www.epsiplatform.eu>, last accessed: August 12, 2013.

recital 12). In 2012, the European Commission planned the launch of a data portal in order to provide a single point of access to search for its data. The data shall be provided in any existing format or language without the need of an individual application (unless otherwise specified) and the reuse is basically free of charge. An enlargement towards the coverage of data from all EU institutions and agencies is planned. In spring 2013, the Commission's data portal was released online⁵ in a beta version; the announced "pan-European open data portal" will follow. The latter is conceptualized as a multilingual interface with datasets from the national, regional, and EU level with the aim that one-third of the available public sector data of the member states can be accessed here by 2015 (the already existent portal *publicdata.eu* can be seen as a prototype). In the light of the frequently emphasized importance of accordance of national and regional activities, and using the example of Austria, we will turn to the member states level in the next chapter in order to gain a deeper insight into whether national structures and implementation activities keep up with the supranational performance.

3 Open Data Ambitions at National Level: the Austrian Approach

Although the European Commission has been dealing with the issue of PSI since the end of the 1980s, it has only been over the last few years that the issue has gained more and more attention among national administrations, which play a crucial role as creators and collectors of PSI. And despite the PSI Directive of 2003 being a first step towards a minimum harmonization concerning PSI reuse among the member states, to date existing national rules on the reuse of PSI vary strongly. For example, according to the "PSI scoreboard," the UK, Spain, or the Netherlands are considered to be example-setting operators; some states pursue isolated approaches only, and yet others are still reluctant.⁶

Against this backdrop and particularly under the Europe 2020 regime, the Commission makes reasonable efforts to enforce a stronger harmonization of national approaches and invokes the respective accountability of the European level, as well as of national and local administrations. The National Reform Programmes (NRPs) are the key tool in translating the Europe 2020 targets into national policies: They break down the Europe 2020 targets into national targets and define related measures that need to be taken. The Austrian NRP reflects the need of PSI provision and the European Commission's open data initiative as barely as those of the other member states.⁷ Instead, open government is only affected by referring to digital communication in general and e-government solutions in particular. The neglect of the issue of PSI in the NRPs may be taken as first evidence for the suspicion of a

⁵ <http://open-data.europa.eu/en/data>, last accessed: August 12, 2013.

⁶ <http://epsiplatform.eu/content/european-psi-scoreboard>, last accessed: August 12, 2013.

⁷ Based on a keyword search in the 2011 NRPs of the EU-27.

certain inconsistency between supranational and national levels. Nevertheless, open data were stated to be an aspiring topic at national level in Austria.⁸

In this chapter, we illustrate the experiences of Austria, because it is considered to be one of the leading countries in the EU with regard to sophistication and availability of e-government services (European Commission 2010d). From a global perspective, Austria can be seen as one of the top-emerging leaders in the development of e-government (United Nations 2012). Thus, it also seems to be an interesting example to investigate national open-data ambitions, as it could be assumed that an e-government leader may also be an exemplary open data operator.

In Austria, the municipalities are the drivers of opening public data, whereas the federal level, the uncontested protagonist in terms of e-government, is regarded as “dispassionate”⁹. While Austrian cities like Graz, Salzburg, and Linz, but especially Vienna, have been very active, the federal level was reserved and concentrated on a primarily coordinating role, resulting in the foundation of the “Cooperation Open Government Data Österreich”¹⁰. The corresponding website *data.gv.at* serves as a national meta portal and lists 870 datasets—from different policy areas such as geo-spatial data on farmer’s markets, public toilets, or skiing areas, statistics on the age distribution of the population, ozone pollution data, or real-time public transportation data—that are published by units at all administrative levels (the “producer side”). Yet, less than 7% of the datasets stem from federal bodies.¹¹ Compared to most of the municipal initiatives, the open data issue at federal level is not a political, but merely a pragmatic one, which is mainly driven by some interested persons aiming to be well equipped in the face of upcoming challenges.¹² Hence, from a federal perspective, the Austrian federal data portal is seen as a response to the steadily growing number of local open data portals (due to Austria’s federal character and the regional responsibilities), as a possibility to standardize efforts of individual data providers, and to have a coordinated linkage of all existing Austrian open datasets with the planned pan-European portal in 2015.¹³

Besides the public bodies, there are initiatives from civil society that aim to further the topic (the “demand side”), such as the *OPEN3* association. *OPEN3* is very active in raising awareness of the open data issue, e.g., by conducting surveys among politicians, visualizing public budgets, or programing a visualization tool for geospatial data (*DataMaps.eu*). Moreover, *OPEN3* co-organizes bar camps and

⁸ Interviewee 2: manager responsible for open data in the e-government department in the Federal Chancellery.

⁹ Interviewee 2: manager responsible for open data in the e-government department in the Federal Chancellery.

¹⁰ In Austria, the term “PSI” is strongly connected with the PSI Directive, while “open data” or “open-government data” refer to national developments and are commonly used (Donau-Universität Krems 2012).

¹¹ All figures are as of August 12, 2013 and were taken from *data.gv.at*.

¹² Interviewee 2: manager responsible for open data in the e-government department in the Federal Chancellery.

¹³ Interviewee 2: manager responsible for open data in the e-government department in the Federal Chancellery.

create camps where programmers experiment with open data.¹⁴ Most recently, not just stakeholders like *OPEN3*, but also the media exerted increased pressure on open data providers in Austria. Especially the public transportation company *Wiener Linien* came under fire in March 2013. Starting a petition and supported by the daily press, *OPEN3* board members demanded the release of real-time data of the public transportation system in Vienna. After a political decision, *Wiener Linien* finally bowed to public pressure and promised to publish its data in summer 2013. The current open data developments show the high political relevance of the topic and underline the central role of municipalities in general and the City of Vienna in particular, which is—due to its special position, what we will outline in more detail in the next chapter—not only one of the biggest data holders in Austria but positions itself also as a crucial role model for national and international imitators.¹⁵

4 Local Open Data Ambitions: the Example of Vienna

In this chapter, we present the open data efforts of the City of Vienna as an illustrative example. Vienna was chosen not just because it presents itself to be one of the exemplary operators in terms of open data at local level in the German-speaking world, but also because its efforts were acknowledged in a recent survey which compared selected open data portals in Europe (Fraunhofer IAIS 2012). Against this backdrop, we are interested in whether, and to what extent, there is a coherence, indifference, or even divergence between the EU PSI strategies and the implementation efforts in Vienna. Furthermore—and as we rather observe in the case of Vienna—we aim to identify possible reasons and relevant variables as to why there is still room for improvement as far as the translation of EU ambitions in the local context is concerned.

Background

Vienna takes a special position due to its twin role as federal state and municipality on the one hand, and as Austria's capital city on the other hand. With a current population of over 1.7 million inhabitants, the city employs about 28,000 people in its core administration and a further 60,000 people in hospitals and corporatized units (e.g., in public transportation). The administrative apparatus is characterized by its large size (it is, in fact, one of the biggest employers in Austria), the broad spectrum of competences and services, and complex governance mechanisms. Traditionally, Vienna has the typical characteristics of a legalistic *Rechtsstaat* administration (Hammerschmid and Meyer 2005), with a strong procedural logic and a focus on

¹⁴ Interviewee 4: OPEN3 Association: board member.

¹⁵ Interviewee 1: CIO of the City of Vienna.

administrative law. In the last 2 decades, this traditionally hierarchical-bureaucratic and corporatist governance system has been accompanied by a distinct public service focus and a strong managerial orientation (Hechtner 2011; Theimer 2004), like elsewhere in the Austrian public administration (Meyer and Hammerschmid 2006). In order to create higher managerial autonomy with new ways of steering and control, the City of Vienna has chosen a relatively decentralized governance approach and implemented a broad array of new public management (NPM) tools. Especially the increased competition in respect of business location demands a high level of activity from the City of Vienna, not only with respect to economic growth, but also quality of living, and a certain lifestyle which attracts in particular creative entrepreneurs (Sassen 2005). Latest rankings show that, although in 2012, for the fourth year in a row, *Mercer* placed Vienna first in its quality of living ranking, Vienna does not perform equally well as regards its economic potential (for example as assessed by the *European Cities Monitor*; see Meyer et al. 2012). These developments not only show the rise of challenges, but may also be an indicator for the capacity of the administration to absorb new reform waves and paradigms. And although strong legalistic administrations are known to be reserved reformers (e.g., Derlien 2003; Kuhlmann 2010; Pollitt and Bouckaert 2011) or “maintainers” (Pollitt and Bouckaert 2004, p. 186), the City of Vienna follows a fashionable course oriented along international reform trend routes (Hechtner 2011). This is not least because—based on a clear political request—the city administration tries hard to be a top performer among the German-speaking public administrations in terms of public management reforms. However, as research has shown that many public sector reform projects are widely announced, but do not attain practical impact (Brunsson 2002), we discuss the latest reform topic—the open government strategy for Vienna—in more detail.

The City of Vienna’s Open-Government Strategy

In October 2010, elections were held in the city and the following coalition agreement between the social democratic and the green party included a clear commitment to open government and open data. The responsibility for both the open government and the open data activities lies in the hands of the “City Councilor for Integration, Women, Consumer Protection and Personnel” on the political side and the chief information officer (CIO) on the administrative side (Krabina et al. 2012). As a coordinating body, a municipal *Open-Government Data Competence Center* was founded which serves as an internal governing body for the open data activities (ibid.). Besides the CIO, who plays a leading role, its members are representatives from the ICT department, the communication department, and the departments that provide the data to be published. It is the task of the competence center to assess which data have been made public by the city so far, what other public sector bodies have released, and what the stakeholders want to be published (ibid.).

Vienna already began to upload the first datasets to its open data portal (*data.wien.gv.at*) in March 2011. In July 2012, the office of the CIO issued the *city’s*

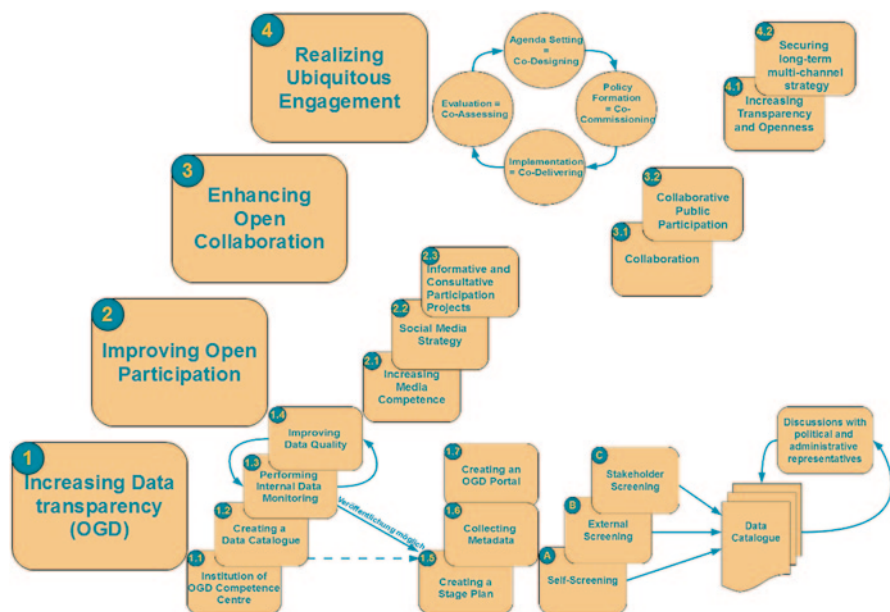


Fig. 2 OGD implementation model of the City of Vienna. (Source: Krabina et al. 2012, p. 44)

open-government strategy, assisted by a management consulting company (Krabina et al. 2012). This strategy (see Fig. 2)—in which the *City's Open Data Strategy* is embedded—was derived from a consecutive four-stage model by Lee and Kwak (2011) from the *IBM Center for The Business of Government*.

The strategy sees open-government data as the first important stage in the development towards an integrated open-government system (Stage 2 is about *participation* issues, Stage 3 focuses on *collaboration* aspects and, finally, Stage 4 aims at realizing an *ongoing engagement*).¹⁶ According to the city's strategy, two tasks dominate the first stage: (a) identification of data which are of high value or high impact and (b) assurance and improvement of the quality of data. To achieve this goal, the establishment of a *competence centre* (measure 1.1) is intended in the strategy just as the *creation of a data catalog* (measure 1.2). Furthermore, all the departments of the city are required to conduct ongoing *internal data monitoring* (measure 1.3), i.e., to check which of their datasets would be suitable for publication (e.g., if there are legal and copyright restrictions, and if an added value can be ascertained). The *quality of the data* (measure 1.4) is to be improved constantly by applying the ten principles set by the Sunlight Foundation (2011). A *stage plan* (measure 1.5) was developed serving as a timetable that outlines when which dataset should be published. Moreover, a special focus is put on the issue of the *collection of metadata*

¹⁶ However, when a closer look at the open government strategy is taken, it has to be remarked that while the first stage is described in detail, the steps 2-4 are documented to a far less comprehensive extent.

of the datasets (measure 1.6); here, the standards defined by the aforementioned “Cooperation Open-Government Data Österreich” working group are applied. Last, an *open data portal* (measure 1.7) will be developed and integrated in the website of the city (Krabina et al. 2012).

Status Quo of the City's Open Data Activities

Already at the beginning of 2013, the first stage of the open-government strategy had been almost fully adopted.¹⁷ Currently, there are 226 entries on the city's data portal from very different domains (e.g., statistical data like birth rates, economic data on commuters, or financial data like the statement of accounts for recent years)—however, some datasets are listed in more than one category.¹⁸ A special focus is put on geospatial data as Vienna is investing € 1 million per year in maintaining a digital map of the city with over 100 layers and including, for instance, the locations of parks, city bike stations and public toilets.¹⁹ In sum, 89 apps for smartphones (e.g., the *Toilet Map Vienna* or *Citybike Wien*, i.e., visualizations of the city's public toilets or stations for bikes with Google Maps) and desktop visualization solutions (e.g., *Vornamen in Wien*, a website-based visualization of the most popular first names for babies in recent years) have been programed so far, most of them by private persons on a voluntary basis, and were linked to the city's data portal.²⁰ In respect of the *competence centre*, the office of the CIO organizes a meeting (“open-government data platform”) with interested stakeholders (citizens, IT community, companies, and academia) once per quarter to identify further datasets to be made available to the public. In order to extend the data catalog continuously (e.g., adding datasets from fields like culture or traffic), the city also defined focus areas and step by step—in 13 tranches with five to 10 datasets including the metadata—each will be put on the portal.²¹ Based on a set of criteria in the open-government strategy, internal data monitoring assesses datasets with regard to their suitability for disclosure. Due to continuous communication with several stakeholder groups, the City of Vienna not only endeavors to discover errors and to improve the quality of data, but is also interested in discussing their needs and ideas.²²

Recently, an external evaluation study concluded that the governance structure with the *open-government data competence center* led by the office of the CIO can be considered as one of the main success factors of the Viennese model (Donau-Universität Krems 2012). But the same study also stated that the opening of the datasets currently available was like the harvest of “low-hanging fruits” (Donau-

¹⁷ Interviewee 1: CIO of the City of Vienna.

¹⁸ <http://data.wien.gv.at/katalog>, last accessed: August 12, 2013.

¹⁹ Interviewee 1: CIO of the City of Vienna.

²⁰ <http://data.wien.gv.at/apps>, last accessed: August 12, 2013.

²¹ <http://data.wien.gv.at/aufnahme-datenkatalog.html>, last accessed: August 12, 2013.

²² <http://data.wien.gv.at/veranstaltungen>, last accessed: August 12, 2013.

Universität Krems 2012, p. 18), as most of the datasets—e.g., the geospatial data—were already available in the city administration and could be put online without much further effort. Yet, for data that still have to be collected or quality checked, the costs are estimated to be much higher. The survey also highlighted that the economy is not overwhelmingly interested in open data yet—partly due to a general risk-avoiding business culture in Austria and because no business models on open data have so far been developed (*ibid.*). Nevertheless, in a recent comparison with other larger German-speaking cities (Munich, Bremen, and Berlin), Vienna ranked first in terms of the number of datasets and apps using the published data (Fraunhofer IAIS 2012).

Influence Factors: What Drives the City of Vienna?

The description of the status quo demonstrates that in terms of open data, the City of Vienna is a fast and ambitious operator. But this is not only the case in matters pertaining to open data but to most reform trends under the banner of NPM²³ within the last 2 decades. In order to be recognized as a top-reformer within the German-speaking public reform community, the city implemented a broad array of management tools and portrays itself as an active reformer (Hechtner 2011). A clear political position provides the basis for this continuous development. And it is exactly this strong political alignment that can be considered as the most important driver in terms of the promotion of open data activities.

Moreover, elements of mimetic isomorphism (DiMaggio and Powell 1983) can be identified, as Vienna is strongly oriented towards upcoming international reform trends from non-German speaking public administrations. Open data can be regarded as one of the most fashionable reform topics of the last few years, with a high public appearance and visibility in the media. This high visibility is the result of many new products, developed on the basis of open datasets. Especially young and technically sophisticated urbanites appreciate the broad range of new and helpful applications. On the whole, the new services are associated with the City of Vienna, although independent developers are responsible for the products. Due to its role as a leading city ranked by *Mercer* in terms of lifestyle and quality of life, elements that help to remain in this leading position are highly welcome—as new services in form of apps demonstrate. Thus, we argue that following the chosen way—also with the help of external programers and other stakeholders who develop new products—can be very attractive for lifestyle cities to continue improving their image as highly livable metropolises.

²³ We acknowledge that the international academic debate is already one step further and centers—with hindsight to the dysfunctions and shortcomings of some of the NPM reforms—on the question of “what’s next” in the post-NPM era of public governance (Christensen and Lægreid 2011; Dunleavy et al. 2006; Lapsley 2009). Yet, in the public management reform discussion in Austria, NPM arguments are often still used.

While especially reusers with a large headcount regard public administrations not only superficially as data providers but instead as the most important customers of solutions based on public sector data,²⁴ it seems that the City of Vienna itself mainly takes the providing role and does not see the need to take the demanding role (although *public government authorities* are mentioned as stakeholders in the city's open-government strategy, Krabina et al. 2012). Beneficiaries of open data are seen primarily as external; from a city's point of view, it is especially third parties that should think about useful products, while the city itself does not function as an active demander of new services based on its own data. In this context, NPM arguments in terms of focusing on core competences come to the front and strengthen the city's position in not acting too proactively. Instead, the city seeks for cooperation potential that leaves the production of certain services which are not in its core competence to third parties (if well thought out, the release of data for free could even be at conflict with NPM reform ideas that aim at generating revenues in administrative units).

Besides, external developments and stakeholders increase the pressure on the city administration. It is especially cooperations in the form of networks and exchanges with other public administrations in the German-speaking world that can stimulate this effect. There are regular conferences where municipalities present their efforts; these events serve as a kind of benchmark for the open data activities in particular and reform efforts in general. But also actors from civil society are putting pressure on the administration—as for instance the petition from board members from *OPEN3* to release the real-time data of *Wiener Linien* online, which can be seen as an example to find a consensus in an issue area that is contested (Meyer and Höllerer 2010).

5 Discussion and Conclusion

We started our research by asking the question of what degree of coherence there is between European PSI strategies and the corresponding national implementation activities, i.e., how supranational strategies on open data are “translated” at local (national and regional) level. On the one hand, we found the European Commission to be a very ambitious actor and an advocate of the release of public sector data and the harmonization towards coherent national policies. Activities at European level clearly have a strong focus on economic issues (not least due to the European Commission's competences) and the belief that the unlocking of the potential of PSI can help to reach the Europe 2020 targets. On the other hand, we investigated the open data efforts of an implementer, the City of Vienna, that regards itself as one of the best practice examples among the German-speaking cities, and found that those aspirations have only very little to do with European ambitions and are, one might even say, decoupled from supranational strategies. Due to past experience of

²⁴ Interviewee 3: business developer in the Austrian subsidiary of a large ICT company.

implementing the PSI Directive, it was to be expected that ambitions at EU level would only have minor influence on national and especially regional open data policies and efforts. To some extent, the Austrian example has confirmed this assumption but has also provided possible explanatory aspects which are worth discussing below in further detail.

First, Austria shows a general hesitant attitude towards administrative reforms and has a reputation as a late adopter (Wutscher and Hammerschmid 2005). More currently, also the cautiousness towards the potential of open data, and consequently its implementation, are originated in the deeply anchored legalistic tradition (Hammerschmid and Meyer 2005). Against this backdrop, and while the European Commission with its open data activities finds itself in the “digital-era governance” age (Dunleavy et al. 2006), Vienna still draws on a strongly internal and NPM-oriented concept which seems to be, in the post NPM era, only moderately contemporary in an international comparison. In fact, in the case of Vienna, internal management aspects (i.e., how to deal with the topic from an organizational point of view, e.g., setting up a project structure for “executing” the open-government strategy in the city) and issues of privacy and legal liability come to the fore. In a nutshell: In the era of public governance (Osborne 2010) and outcome orientation, it appears that Vienna focuses more on processes and inputs than on governance aspects and outcomes; instead, lifestyle and reforming arguments (open data as a “must have”) dominate the municipal discourse. Principally, a strong management focus seems to be legitimate to the extent that concrete implementation is a local-level task, while the general strategic oversight remains at supranational level. However, this restricted approach might have further implications and can even generate odd by-product outcomes. There is the danger that implementation efforts might be limited to mere formality without recognizing the “underlying philosophy” of the reform topic: Open data is much more than just a mere management item, it is an attitude and an organizational culture topic. The way in which the city acts can be explained in part with its embeddedness in Austria’s distinct bureaucratic administrative tradition, which is characterized by a strong focus on processes or characteristic principles, such as official secrecy. Our findings clearly point to administrative tradition as a relevant factor of influence as regards the national implementation of global reform topics (see also Meyer et al. 2013). Therefore, bearing in mind the heterogeneity of the EU member states and their various administrative traditions (Hammerschmid et al. 2007), it remains questionable as to whether open data is a suitable issue for Europe-wide harmonization efforts.

Second, the heterogeneity of the EU member states, the observed importance of administrative traditions and the respective dealing with reform topics can result in a decoupling of supranational strategies and national implementation efforts. This happened in Austria, where we can observe a quite fragmented open data scene. In order to avoid once ambitious European open data efforts winding up as lifeless “trend ruins”, national, and especially local, implementers also need a broader strategic connection and orientation. For the Austrian example, on the one hand, one reason for the decoupling can be found at federal level, showing restraint in terms of the subject and not acting as an active “translator.” As the European mul-

tilevel governance structure does not traditionally provide many points of direct contact between supranational and local levels, such an active “translator” would be needed—and for federally organized countries such as Austria, the central level should play this role. But in terms of open data, the Austrian central level acts very reluctantly and does not function as a connecting link in a multilevel governance system, as we demonstrated, among others, with the fact that the open data issue is not mentioned in the national NRP. On the other hand, from an internal perspective, it is not enough for the central government to solely monitor activities in Brussels and to assume coordinating tasks of a technical nature towards the setting of meta-data standards and to ensure the connection with the pan-European portal in 2015. In contrast, a “translator’s” task would be to connect the local implementers to a broader (European) strategic vision, and, from an internal-management perspective, to hand out one “culturally refined” roadmap for all governmental levels in order to sustain better coordination within Austria. A promising approach to enhance the connection between the strategically oriented supranational level and the implementers at regional and local level could be the strengthening of soft-law measures. We found that, from a governance perspective, the open data issue is a very competitive one and that especially local implementers are very present on data portals and conferences. Therefore, the open data scene seems to be more steerable by soft law measures like data portals, expert groups or awards that follow the best-practice idea than by hard-law measures like new directives. Thus, cooperating and coordinating elements should be strengthened both at supranational and national level.

Third, all that glitters is not gold. Although the City of Vienna has won some prizes and holds a top position in rankings in the German-speaking world, from an international comparative perspective, no breakthroughs have been achieved so far that would go beyond the “standard” solutions like the visualization of data of the city’s apple trees or the reporting of damaged streetlights—acknowledging that the city’s open portal is still growing and also most other cities have not yet achieved their open data goals. It has been argued that the city’s open data activities to date have focused only on disclosing datasets that could easily be published (Donau-Universität Krems 2012). So, special attention will have to be paid on how the city will develop the open data portal in the future, i.e., how it will deal with requests for datasets that are seen as classified material in the eyes of the administration (e.g., the real-time data of *Wiener Linien*). Furthermore, as the open data activities are only one stage of the open-government strategy, the question remains as to which results will be achieved on the other stages of the open-government implementation model (Stage 2: *participation* issues, Stage 3: *collaboration* aspects, Stage 4: *ongoing engagement*) and how intense the respective efforts will be. The city is required to see open data not only as a mere process, but as a kind of “philosophy” towards more participation, transparency, and accountability in line with a “digital-era governance”. It remains to be seen if the implementation of the next stages of the open-government model will make the philosophy come “alive.”

Fourth, with regard to the role of the public sector as a supplier and/or demander of PSI, on the supranational as well as on the local level we found a strong orientation towards external beneficiaries. The strategic as well as the implementation

level show an almost exclusive focus on the needs of reusers and are strongly oriented towards third parties. In fact, the City of Vienna only benefits with regard to its image, but there are no steering or control benefits offered by the use of PSI. However, our results shed light on the potential that open data has for the public administration itself and give an idea of a more sophisticated use of public sector data: We consider the public sector itself as the most important customer of its own data; therefore, seeing beneficiaries exclusively in third parties seems to be shortsighted. Instead, public administration would be required to request innovative products and services actively from the reusers (e.g., solutions for the prediction of traffic jams in the rush hours based on real-time telematics data) in order to create growth and jobs. So, public administrations have to discover the potential of their own data in offering new services, improving existing ones, or for cross-departmental or cross-territorial collaborations.

Fifth, and last, we see two challenges which might hinder a successful translation and implementation of the open data agenda. On one hand, we identified some tension between transparency issues (“all data shall be published for free”) and the NPM reform paradigm with its idea that administrative units should develop business models in order to generate revenues, e.g., by selling profitable data from the commercial register to the customers (Hood 1991)—here, it remains the political and administrative task to find an adequate pricing model for the data. And, on the other hand, the context of the Austrian public administration does not seem to be fertile soil for open data activities in the long term. There is some evidence that Austria “rides” on the open data wave as long as the topic is trendy—however, when the wave dies down, Austria will, as experiences with other reform topics have shown, most likely not follow international champions like the UK (which so far has published almost 10,000 datasets) or the ambitions of the European Commission (more than 6,000 datasets). So, the question of how engagement with the issue can be secured, remains. The answer may be found in soft-law measures.

In any case, in June 2013, the European parliament and the council signed Directive 2013/37/EU amending Directive 2003/98/EC on the reuse of PSI (Official Journal of the European Union 2013). It is expected that the development of open data especially at national and local level will thus experience a new boost and pick up speed. So, the projected influence of the revised PSI Directive provides another interesting avenue for future research, i.e., discovering how it will resonate with both national and local levels from a translation perspective.

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Realizing Data Sharing: The Role of Spatial Data Infrastructures

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1 Data Sharing in an SDI environment

Collection, management, exchange, and use of data and information are key tasks of public administrations. Data sharing can be considered to be a requisite for e-government activities (Gil-Garcia et al. 2009). Sharing public sector data can provide numerous benefits to governments and the public. Data sharing contributes to efficiency, effectiveness, and responsiveness in the public sector (Landsberg and Wolken 2001), and the extensive list of benefits includes technical (e.g., streamlined data management), organizational (e.g., reduced costs), and political (e.g., more public accountability) benefits (Dawes 1996; Vancauwenberghe et al. 2011). As policymakers become aware of the need of sharing data, initiatives to coordinate and facilitate data sharing are developed at different levels and in different areas (Crompvoets et al. 2011). Within the huge amount of data that are used and managed by public administrations, different types of data can be distinguished. Spatial data are a type of public sector data, alongside data on citizens and businesses, data on public sector products and activities and time-related data (Wallace 2007).

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Spatial data are special in that they refer to a location on the earth (Van Loenen 2006) and are of increasing importance for the execution of governmental tasks (Kok and Van Loenen 2005). Typical examples of spatial data that are collected and used within the public sector are topographical maps, hydrographical data, cadastral data, administrative boundaries, and road networks (Groot and McLaughlin 2000).

As spatial data can be used in a high number of fields and applications, considerable savings might be possible in staff, technology, production, and maintenance costs by sharing spatial data (Nedovic-Budic et al. 2004). Besides the argument of cost-savings, several other arguments are often provided to promote the sharing and reuse of spatial data. Sharing spatial data significantly contributes to the quality and geographical coverage of these data (Rajabifard and Williamson 2001) and is often the only manner to get access to certain data. The development of Spatial Data Infrastructures (SDI) can be seen as an answer to the need to facilitate and promote the sharing and reuse of existing spatial datasets (Groot and McLaughlin 2000). The concept of SDI refers to the collection of initiatives and arrangements to facilitate and coordinate spatial data sharing between data producers and data users. Typical components of an SDI are data, metadata, the institutional framework, standards, and policy (Rajabifard et al. 2003; Craglia and Johnston 2004).

Many authors see an SDI primarily as a coordinating mechanism. According to Crompvoets, Bregt, Rajabifard and Williamson (2004), an SDI is about the facilitation and coordination of the exchange and sharing of spatial data between stakeholders in the spatial data community. Budhathoki, Bruce and Nedovic-Budic (2008) describe SDIs as mechanisms for the coordinated production, discovery, and use of geospatial data in the digital environment. According to Masser (1999), it was the need for some form of government intervention to coordinate data acquisition and availability that underlies the first SDIs. Craglia and Johnston (2004) see coordination as the most important component of an SDI “because without it all the other ones would either not happen or do so in a very fragmented and inconsistent way.” Following the definition of Bouckaert, Peters and Verhoest (2010), coordination can be defined as the alignment of tasks and efforts of different actors. From the perspective of an individual actor, coordination is about the extent to which this actor attempts to ensure that his activities take into consideration those of other actors. The concept of coordination refers to the process of bringing tasks and efforts into alignment, in which different coordination instruments and mechanisms can be used, as well as to the result or outcome of this process. In the public sector, coordination efforts should lead to greater coherence, and the reduction of redundancies, lacunae, and contradictions within and between policies and actions (Bouckaert et al. 2010). Coordination problems can arise at different levels, and often a distinction is made between intraorganizational and interorganizational coordination. Also in the context of SDIs, coordination problems and coordination efforts are situated at several levels (Vancauwenberghe 2013). While SDI implementation strongly focuses on coordination at the level of the entire SDI, coordination is also needed at organizational level and at process level.

Although several authors have stressed the importance of coordination in the context of SDI development, only a few authors have analyzed the effect and im-

pect of coordination efforts and mechanisms. Craglia (2003) provided empirical evidence for the importance of coordination in developing SDI. The comparative analysis of the SDI-related activities in different countries demonstrated that the majority of countries and regions with a well-developed SDI are characterized by strong coordinating frameworks and mechanisms. Based on a survey among local governments in two US states, Harvey and Tulloch (2006) revealed that individuals often consider coordination as the main driver for realizing data sharing. However, additional interviews showed that many government organizations do not coordinate their geospatial activities due to the financial, legal, logistical, and other issues that make coordination difficult and complex. In a case study performed by Nedovic-Budic and Pinto (1999), several coordination issues were identified as determinants for interorganizational spatial data activities. In general, the study demonstrated how the nature of the coordination process was the key for the overall success of multi-participant spatial data activities.

Until now, the focus of most SDI developments has been on sharing of spatial data between data producers and data users within government. Although SDIs can also be used as mechanisms to give citizens access to spatial data, originally little attention was paid to the potential role of SDIs in fulfilling the spatial information needs of citizens, businesses, and other potential users outside of the public sector. However, the awareness has gradually grown that spatial data could also be of high value for nongovernmental users. An indication of this evolution can be seen in the Location Information Strategies of several countries. By way of illustration, the Location Information Strategy for the UK (UK Geographic Information Panel 2008) and the Dutch GIDEON strategy (Netherlands Ministry of Housing, Spatial Planning and the Environment 2008) both highlight the importance of making spatial data accessible to citizens and businesses. Also, according to the Finnish strategy, location information can serve as a basis for new companies to develop their ideas into new products and services for a growing market (Finnish Ministry of Agriculture and Forestry 2010). The Finnish strategy also mentions the role of location information in support of citizen participation in public affairs.

Despite the growing awareness, numerous barriers still exist which hinder or prevent spatial data sharing (Tulloch and Harvey 2007). Azad and Wiggings (1995) stated that “data sharing is easier to advocate than to practice.” Harvey and Tulloch (2006) demonstrated that data sharing is still limited, mainly at the local level, even when—at the central state level—the technologies are available and the necessary policies are in place. Also, Elwood (2007) argues that the notion of free and open data that underlies the SDI concept is impeded by political and legal structures, individual and institutional attitudes, liability concerns, and the desire for cost recovery. Harvey and Tulloch (2006) also revealed several concerns related to data sharing arrangements, including difficult interorganizational relationships, funding, data sensitivity, and data privacy. According to McDougall (2009), the lack of effective mechanisms to share spatial data among governments and the private sector is still an important barrier to a more effective and efficient use of spatial data throughout society. Research is needed to determine the role of coordination in

Table 1 Comparison of the four cases with regard to process characteristics

	Zoning plans	Traffic accidents	Addresses	Flood maps
<i>Policy domain</i>	Spatial planning	Traffic safety	Various	Water policy
<i>Key process actors (responsible for data collection)</i>	Flemish spatial planning department, provinces municipalities	Local police, federal police	Municipalities	Flemish environ- ment agency, Flemish mobil- ity department, provinces, water boards
<i>Main process activities</i>	Policy-making and analysis	Inventory and analysis	Inventory	Analysis and policy-making
<i>Relative impor- tance of spatial data</i>	High	Medium	Low	High

overcoming these barriers and concerns and to explore the potential contribution of SDI to the open data process.

Therefore, the objective of this chapter is to analyze whether coordination in the context of an SDI contributes to spatial data sharing, not only within the public sector but also to actors outside the public sector. A comparative case study research design was chosen in order to uncover the similarities and differences between four public sector processes in Flanders (Belgium) with regard to spatial data sharing and coordination. In the following section of this chapter, we briefly describe the research strategy and provide a description of each of the four processes. The next part presents the results of a comparative analysis of the four processes with regard to the degree of spatial data coordination and sharing. Finally, we discuss the current and potential impact of SDIs on data sharing.

2 Research Strategy and Cases

In order to realize the central research objective of this chapter, a case study design was developed and applied. The selected cases needed to provide insight in the impact of different coordination initiatives on the sharing of spatial data in public sector processes. Three main selection criteria were applied: (1) the unit of analysis was a clearly identifiable process within the public sector in Flanders; (2) multiple organizations are involved in the process; and (3) spatial data are used in the process. Four processes were selected as a case: the development of zoning plans, the management of traffic accident registrations, the management of address data, and the mapping of flood areas. Each of these four processes is consistent with our definition of a case, but differ from each other with respect to the policy domain in which they are situated, the actors that are involved, the main process activities, and the relative importance of spatial data to the process. Table 1 shows the differences between the four selected processes with regard to these characteristics.

Information on coordination and sharing of spatial data was gathered in the same way for each of the cases. In-depth interviews with people from key organizations

in the interorganizational processes were carried out and relevant documents were collected. In each case information was collected in multiple organizations, on both the process in general and the specific role of the individual organization in the process. This made it possible to analyze similarities and differences between and within the four processes. In each of the organizations, several persons in various positions and of various profiles were interviewed by means of semi-structured interviews using a topic list. The information on spatial data sharing and coordination was collected through interviews with the process owner, the GIS coordinator, the spatial data operator, and the head of the department. These interviews were recorded, transcribed, coded and the information was structured in summary documents which were cross-checked with the people interviewed. Five researchers from different disciplines were involved in the data collection: public management, sociology of organizations, geomatics, law, and economics. A case study protocol was designed to ensure that similar procedures were followed for all interviews in order to increase the reliability of the case study.

Zoning Plans

Zoning plans are important instruments in the spatial planning policy in Flanders. Zoning plans are aimed at the development of a specific area ranging from a single parcel to an entire city district. A zoning plan determines which activities can take place in a specific area, where it is allowed to build, which regulations need to be followed, etc. Zoning plans are developed at three governmental levels: the regional, the provincial, and the municipal level. A similar procedure for developing and approving a zoning plan is followed at each level. The first phase in the creation of a zoning plan is the development of a preliminary draft zoning plan. In the following phase this draft plan is discussed with different governmental administrations involved and with the public. The procedure ends with the definitive enactment of the zoning plan by the government administration involved and its following publication in the Belgian Government Gazette. Each zoning plan comprises a graphical plan that represents the area to which the plan applies; the regulations with regard to zoning, development and management of the area; and the reproduction of the physical and judicial state of the area. Spatial data are used in different phases of the procedure and in different ways. Spatial data help to gather information on the physical and legal condition of the planning area and are used in the actual design of the plan. Moreover, the availability of digital zoning plans itself supports the ease of use of the plans by other organizations.

Traffic Accidents

Traffic data are essential for the design and implementation of an effective traffic safety policy. Such traffic data can include data on traffic infrastructure, on traffic controls, or on traffic volumes and flows. The basis for most traffic safety analyses

are, however, traffic accident data. Traffic accident data are not only used to express and communicate the traffic safety problem, but also to map risk factors or to analyze the impact of specific traffic safety measures. Spatial data is increasingly being used for the registration of road accidents in order to monitor road safety and to evaluate road safety policy. In Flanders, the collection and analysis of accident data is put forward as a key task in the traffic safety policy. Traffic accident data are seen as the primary data, also data on infrastructure, traffic behavior, traffic composition, and traffic enforcement are considered to be essential. In Flanders, many stakeholders are involved in the process of collecting, managing, sharing, and using traffic accident data. While the registration of traffic accidents is mainly in hands of the local and federal police, organizations like the Department for Statistics and Economic Information, the Flemish Mobility department, the provinces and the municipalities are also involved in the management and use of traffic accident data.

Addresses

Much government information is linked to addresses. Governments at all administrative levels make use of address data in the various policy domains. Addresses serve several generic purposes, such as location (e.g., for visits or the delivery of mail), identification (e.g., building registration), jurisdiction (e.g., authority responsible for the property identified by the address), and emergency response. While spatial data can be used in support of address data collection and management in an efficient and effective manner, addresses themselves are one of the key types of spatial data. As addresses can be easily linked to a specific location, address data make it possible to localize and visualize several types of administrative and thematic data. In Flanders, the municipalities are officially in charge of creating and assigning new addresses, via a limited number of designated processes. In reality, however, addresses are being created or changed in many other processes, and also by governments at other administrative levels. In most cases, an address is considered to be an attribute of a certain entity, such as a person, a company, or a parcel, and the collection and management of address data is often linked to a specific goal, such as the registration of the residence of persons, or the location of a particular parcel. As a result, many address databases are being used by public bodies, with various types of addresses in diverse formats.

Flood Maps

In the area of water policy, spatial data are especially valuable in the process of compiling, updating, using, and distributing flood maps. In Flanders, multiple types of flood maps are used to prepare, monitor, and evaluate the water policy. These maps describe the floods from the past, the recently flooded grounds, the areas that could flood in case of excessive rainfall in the future (based on water modeling), as well as

the delineation of reservoir areas (buffer zones) to hold water in the event of flooding. The creation and maintenance of these various types of flood maps together can be defined as the flood mapping process. In this policy domain, the many organizations involved are each responsible for a specific sub-domain of water management (such as ground, surface, or drinking water), and for specific thematic aspects (such as infrastructural, environmental, cultural, or public health aspects), within a certain administrative border (such as municipal, polder, water board district, provincial, regional, or national borders). This situation has resulted in a highly fragmented water policy. The decree on integral water policy was issued to decrease this fragmentation. The decree states that water policy should be based on the natural water systems (i.e., the basins), instead of on sub-domains, thematic aspects, administrative borders, and government levels. The decree roughly starts from the existing, functional task division between the various organizations involved. In order to reach an integrated policy, a large consultation structure was established. At the levels of each stream basin, river basin, and subbasin, all stakeholders are brought together to develop a water management plan for the water system involved. Water control and flood mapping are part of these water management plans.

3 Results and Findings

An in-depth analysis of these four processes provides insight in both the actions to coordinate spatial data sharing, and the resulting degree of spatial data sharing. This section first provides a discussion of the main results and findings related to both aspects, and ends with a comparison of the four processes.

Degree of Sharing

In order to describe and assess the degree of spatial data sharing, two different aspects need to be taken into account: (1) the content of sharing, which refers to what is shared, and (2) the extent of sharing, which refers to with whom data are being shared. In all four processes, striking differences exist between the involved organizations with respect to the content of data sharing. In each process, the data sharing efforts of organizations vary between sharing an absolute minimum of data and sharing all potentially relevant data. In the zoning plan process, some organizations limit their sharing activities to only make available the finally approved zoning plans in paper form, while other organizations start their sharing activities already in the design phase of the plan, and make use of web services to provide access to the (draft) zoning plans. For instance, at the province of Limburg, spatial zoning plans data are only made available at the end of the process, when the spatial zoning plans have been approved, and even then, in practice there are often delays in doing so. In the province of West-Vlaanderen, spatial zoning plan data are made available

early in the process, at least the delineation of the spatial zoning planning area. Also flood maps are shared in various ways and to different degrees. Some organizations limit themselves to the minimum and only provide answers to specific questions, based on consultation of their spatial data. Yet, in the majority of organizations, information on floods is shared in the form of (digital or paper) flood maps, while the underlying flood datasets are not shared. Only a few organizations, such as the Flemish environment agency, share the actual flood data. Regarding the sharing of traffic accident data and address data, a clear distinction can be made between organizations that only provide aggregated data, and organizations that share datasets of individually localized events.

A remarkable similarity between the four processes with regard to the extent of spatial data sharing is that sharing among public bodies generally is allowed, but that data are hardly ever distributed outside the public sector. For what concerns data sharing within the public sector, a distinction can be made between data sharing with other organizations that are involved in the same process, and data sharing with organizations outside that specific process. The extent of data sharing within the process in many cases is high, as data are being made available to other stakeholders at different stages. Data sharing to other organizations outside the processes is often limited to making available the end product of the process. As a result, organizations outside the processes only have access to finally approved plans or datasets, and cannot take into account plans or datasets that are still in development. In many cases, making data available outside the process is not considered as a priority, and often there are significant delays in making available the finally approved plan or dataset.

In contrast, with the relatively high extent of data sharing with other public organizations, data sharing with companies, citizens, and social profit organizations is characterized by a relatively high level of restrictiveness. This means the potential for reusing spatial data is limited. In most cases, the provision of data only takes place in response to a specific request for data. In other terms, data are distributed reactively, not proactively. Many organizations are not aware of the potential of their data for reuse by citizens or businesses or do not want to stimulate the reuse of their data. The absence of a clear legal framework that addresses issues like privacy concerns, and commercial use is also considered an important reason for the limited data distribution to private and non-profit organizations.

An important aspect that determines the extent of data sharing seems to be the demand for data which organizations are confronted with. While some public organizations receive many requests for spatial data, others experience only a very limited external demand for their data. The demand for data might have an impact on the openness of the data sharing practices of an organization, although this impact can be negative or positive. High external demands for data could lead to a restricted data distribution policy, when an organization does not have the time and capacity to handle all requests. By contrast, high external demands for data sometimes could lead to a more open data distribution policy, when it enhances an organization's awareness that its data can be useful and valuable for other parties. The case study demonstrates that the content of data sharing and the extent of data sharing often

are linked to each other. Organizations sharing extensive datasets, often share these data with many users, within and outside of the public sector. Moreover, the content of data sharing seems to depend on the type of users. While citizens and companies mainly receive answers to specific questions, or are supplied with static paper maps, public organizations usually get access to the underlying spatial databases.

Coordination of Sharing

While the focus of the previous section was on the degree and the extent to which spatial data are being shared, this section examines how spatial data sharing is being coordinated. The collected data on the four processes illustrates that the coordination of spatial data sharing can be situated at three different levels: at the level of the individual organization, policy process, and entire infrastructure (or SDI).

In general, the degree to which the sharing of spatial data is coordinated at the organizational level is rather limited. Most organizations do not make special efforts to ensure that their spatial data activities take into account those of other organizations and actors. Organizations can make use of several instruments to coordinate their data sharing activities. Agreements, formal distribution policies, and standard procedures to handle data requests can contribute to more coordinated data sharing activities. These instruments can complement, replace, and/or support each other. It is striking that in several organizations the distribution of spatial data still happens in an ad hoc and inconsistent way, and none of the above-mentioned coordination instruments are being applied. This trend can be seen in all four cases. In each of the analyzed processes, several organizations hardly coordinate their data sharing activities. However, in all four cases, there are also several organizations that make use of one or several instruments for coordinating data sharing. Most organizations only have a procedure for handling request for spatial data to coordinate their data sharing. However, this procedure is not always strictly followed, which sometimes leads to a situation where identical requests for data are handled in different ways, creating inconsistencies in the organizational data distribution policy. In other organizations, the decision to distribute data to external parties is made by one individual, and thus depends on the goodwill of this person. Again, such examples of insufficient or poor coordination exist in all four cases. In addition to a standard procedure for handling data requests, some organizations make use of agreements to govern data sharing to other organizations. Typically these agreements specify which data (objects) are shared, under which conditions, at what frequency, and so on. Sometimes, these agreements also include a clause limiting the liability of the data provider. An interesting form of agreements is the cooperation agreement between a large group of data producers and users, with the aim of sharing data among all parties involved. Our analysis shows that such cooperation agreements to share spatial data can be found at different administrative levels in Flanders. For instance, at provincial level, the province of West-Vlaanderen has a cooperation agreement with all municipalities in its region. Several datasets are created and maintained

in cooperation with the municipalities, and are published by the province. At the regional level, the departments and agencies of the policy areas, “Spatial Planning, Housing and Immovable Heritage,” “Environment, Nature and Energy,” and “Mobility and Public Works”, of the Flemish government agreed to mutually share their spatial data. Another instrument for coordinating spatial data sharing is the use of a formal data distribution policy. In Flanders, examples of organizations with a formal and publicly available data distribution policy are still rather scarce. The city of Leuven has an explicit policy with regard to the distribution of general administrative documents, which lays down the prices and conditions for all types of data. The previously mentioned cooperation agreement between the province of West-Vlaanderen and its municipalities is also based on a general provincial policy to make all spatial data available to the municipalities.

In the previous part of this chapter, it was stated that spatial data are mainly shared with organizations involved in the same process. An important reason for this seems to be the presence of initiatives to coordinate and stimulate the exchange and sharing of spatial data within the process. In all four processes, such a coordination initiative is found. The exchange of zoning plans is organized and coordinated by a formal guideline for the digital exchange of zoning plans. This guideline was developed and implemented in collaboration with the various stakeholders of the different administrative levels and strives for a strong integration of spatial data related tasks in the various steps of the official zoning plans development procedure. The exchange of traffic accident data is mainly coordinated through bilateral agreements, but in the context of the development of a Traffic Accidents Geographic Information System (in Dutch: OngevallenGIS), the Flemish region and the provinces work together to control, correct, and locate traffic accident data, and to make these data available to other organizations. The development of a Central Reference Address Database for Flanders (CRAB) is intended to coordinate the exchange of address data. In the process of creating, maintaining, and sharing flood maps, two organizations at the regional level play a central coordinating role. These organizations gather flood maps of different sources and share the resulting flood maps with various organizations at other administrative levels, still allowing them to make changes to the data. In all four processes, the data sharing activities of individual public organizations are strongly linked to these interorganizational data sharing initiatives at the process level.

Besides the organizational level and the process level, spatial data sharing in Flanders is also coordinated at the level of the entire public sector. All public organizations in Flanders are considered partners of the SDI–Flanders partnership, whose aim is to optimize the production, the management, the exchange, and the use of spatial data in Flanders. One of the key objectives is to distribute the available spatial datasets to all partners of “SDI–Flanders.” Within the partnership, the regional Agency for Geographical Information Flanders (AGIV) is responsible for the operational coordination and exploitation of the SDI. The AGIV operates as a central data distribution hub. More than 50 full coverage datasets are available, including the street network, hydrographical datasets, cadastral parcels, digital elevation models, the ecological network, land cover, and soil maps. Also zoning plans,

Table 2 Comparison of the four processes with regard to degree of sharing and degree of coordination at different levels

	Zoning plans	Traffic accidents	Addresses	Flood maps
<i>Degree of sharing</i>	High	Low	Low	High
	Zoning plans frequently shared within and outside the process	Little sharing, privacy reasons often regarded as a key barrier	Little sharing, most organizations make use of their own address data	Flood maps frequently shared within and outside the process
<i>Coordination at organizational level</i>	Variable	Variable	Variable	Variable
	Little coordination in some organizations, others make use of one or several coordination instruments	Little coordination in some organizations, others make use of one or several coordination instruments	Little coordination in some organizations, others make use of one or several coordination instruments	Little coordination in some organizations, others make use of one or several coordination instruments
<i>Coordination at process level</i>	Strong	Weak	Weak	Strong
	Formal guideline for the digital exchange of zoning plans	Traffic Accidents GIS suffers from significant delay	Central Reference Address Data-base still under development	Data sharing within the process managed by administrations at the regional level
<i>Coordination at SDI level</i>	Medium	Weak	Strong	Medium
	Zoning plans made available through SDI	Sharing of traffic accidents data not linked to the SDI	Creation and management of data in context of SDI	Flood maps made available through SDI

flood maps, and address datasets are made available and distributed by the AGIV. As such, the AGIV, and the SDI–Flanders initiative in general, contributes to the sharing of spatial data in Flanders.

Comparison of the Four Processes

To conclude this section of the chapter, a comparison is made of the four processes with regard to (1) the degree of sharing and (2) the coordination of sharing. Table 2 presents the values of the four processes for the degree of sharing, and for the degree of coordination at the organizational level, at the process level, and at the SDI level.

In our discussion of the degree of sharing in the four processes, it was already stated that differences between the involved organizations with regard to their degree of spatial data sharing were found in each of the four processes. Nevertheless, the analysis indicates that there also seems to be significant differences between the four processes. In the zoning plan process and the flood map process, a relatively

high degree of data sharing was noted. In both processes, spatial data are frequently shared to organizations within, but also outside of the process. Conversely, address data and traffic accidents data both have a lower degree of data sharing, be it not for the same reason. In the addresses process, hardly any exchange could be observed because each organization (and even each department within the various organizations) usually manages and uses its own address datasets. While these departmental address datasets seem to largely fit their respective needs, a data exchange might be useful for update and control purposes. In the traffic accidents process, the exchange of locational and descriptive accident data is limited. Mainly because of privacy issues, often only parts of the traffic accidents datasets are provided.

The analysis also revealed that there are important differences in the extent to which individual organizations organize and coordinate their spatial data sharing activities. While most organizations hardly coordinate their data sharing efforts and activities, some organizations make use of one or several coordination instruments, such as standard procedures, agreements, or a formal distribution policy, in order to share data in a coordinated manner. In all four processes, the degree of coordination at the organizational level is thus variable, as can be seen from Table 2. Differences between the extent of coordination at the organizational level are not related to the process in which the organizations were active. In other words, the observed differences were mainly situated within each of the processes, and not between the four processes.

In all four processes an initiative is present to coordinate the exchange and sharing of data within the process. Interestingly, the impact of these four interorganizational coordination initiatives is quite different. While the guideline for the digital exchange of zoning plans, and the centralized coordination of flood maps can be considered to be rather successful, both the traffic accidents GIS and the CRAB initiatives seem to face severe barriers and limitations that limit their possible impact. An important reason why the impact of the traffic accidents GIS is limited is because several key actors, mainly at the federal state level, are not involved in the coordination initiative. The traffic accidents GIS also suffers from a significant delay, which leads to out of date traffic accident data. As for the address data, although the development, management, and use of the CRAB is legally arranged in the CRAB decree of 2011, the database is still under development. As a result, the available address data neither up to date nor complete, and the actual use of the collected data is still low. Key strengths of the coordination of the flood maps and especially of the digital exchange of zoning plans seems to be the strong involvement of all relevant actors, and the strong integration of the exchange of these data in the actual data use and management in the respective process. While in the zoning plan process and in the flood maps process coordination at process level is high, the traffic accident process and the address process are characterized by a weak coordination at the process level.

Finally, differences between the four processes are also found with regard to their link to the central SDI initiative, and to its impact on the sharing activities within the various processes. Three processes also rely on the general infrastructure to shape their data sharing activities. Zoning plans, flood maps, and address data are

made available to other organizations through the central SDI–Flanders initiative. For what concerns the address database in Flanders, the role of the central initiative goes even further than making these data available to other partners of the SDI. The AGIV, the already mentioned executing agency of the SDI–Flanders, also coordinates the creation and management of the central address database. As mentioned before, this database is still under development, and the current impact on sharing address data is limited. The management and sharing of traffic accident data is not linked to the central SDI initiative.

Table 2 clearly demonstrates that differences between the four processes with regard to the degree of data sharing might be linked to different degrees of coordination. In the zoning plans process and the flood maps process the degree of spatial data sharing was significantly higher than in the traffic accidents process and the addresses process. Between the four processes, no differences could be found with regard to the degree to which individual organizations involved in the processes coordinated their data sharing activities. With regard to the degree of sharing at the process level, the zoning plan process and the flood maps process could clearly be distinguished from the other two processes. While an initiative to coordinate data sharing is in place in all four processes, only in the flood map process and the zoning plans process this initiative seemed to be well functioning. An important feature of these well-functioning coordination initiatives is the strong integration of spatial data sharing in the actual process activities. Initiatives to coordinate spatial data sharing at the process level mainly aimed at promoting and realizing data sharing among stakeholders within the process. The coordination of data sharing to organizations and individuals outside of the process mainly happens at the level of the entire SDI. Coordination at the level of the SDI is strong in the zoning plans process, the flood maps process, and the address process.

4 Conclusion

This study examined the possible impact of coordination efforts at different levels on spatial data sharing in public sector processes. The findings suggest that differences in the degree of data sharing are mainly related to coordination efforts at the process level and at the level of the larger SDI. An effective approach to promote and stimulate data sharing seems to be to coordinate data sharing at the process level, and to ensure the link between the process and the larger SDI. While some processes already showed a high degree of coordination at the process level, additional efforts might be needed to coordinate and thereby stimulate the coordination activities at the organizational level. It is, however, important not to see spatial data sharing as an end in itself. The actual relevance of data sharing lies in its contribution to the improved functioning of organizations, their processes and their public service delivery. In the processes that have been analyzed in the chapter, an impact of data sharing was found on process efficiency, quality, flexibility, transparency, and reliability.

An important finding of our study is that current initiatives to promote and stimulate data sharing mainly seem to focus on data sharing within the public sector. As data sharing within organizations and individuals outside of the public sector remains limited, citizens, business, and social profit organizations are still only confronted indirectly with the possible benefits of data sharing. Direct benefits of data sharing, in the sense that citizens and nongovernmental organizations have direct access to data and are able to add value to public sector data, are at this moment not achieved. Only if spatial data become open data, the full potential of these data can be realized.

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Policy-Making 2.0: Unleashing the Power of Big Data for Public Governance

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1 Introduction

The rapid emergence of open data portals and the explosion in data availability ('big data') in the government context is opening great opportunities for collaborative governance and innovative way of using modelling techniques for improving policy-making. We refer to this concept as Policy-Making 2.0, defining it as 'a set of methodologies and technological solutions aimed at innovating policy-making' (CROSSOVER 2012a). This umbrella term indicates the interplay between a number of technologies that are applied in order to achieve the target of participative, evidence-based governance, and the related organisational and social processes associated with them. Its scope goes well beyond the 'policy adoption' notion typical of eParticipation and it encompasses all phases of the policy cycle (Mureddu et al. 2012).

Data openness has resulted in some applications in the commercial field, but indeed governments around the world start playing a leading role towards the ambition of realising a 'web of data', in consideration of the expected benefits deriving from the openness in government data (Shadbolt and Berners-Lee 2008). However, the exploitation of open and big data for improving governance and policy-making is happening in a scattered way leading to suboptimal data reuse and impact.

Big data are a fast growing phenomenon: as the Google CEO Eric Schmidt pointed out in 2010, in 2 days is created in the world as much information as it was from the appearance of man till 2003. Nowadays, it is possible to store the entire world's music in a \$ 600 worth disk drive, while Facebook content shared every month amounts to around \$ 30 billion. According to the forecast global data

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in 2010, users and companies stored more than 13 EB¹ of new data, which is over 50,000 times the data in the Library of US Congress (McKinsey 2011).

Every minute, 48 hours of video are uploaded onto YouTube, 204 million email messages are sent and 600 new websites generated. And this is just the beginning, as we are just scratching the surface of data generation, which spans to sensors, medical records, corporate and government databases, and more. As a matter of fact, though big data have been considered an overhyped buzz word, it is not going to go away any time soon, as it is expected to grow at a 40 % rate yearly while the total IT spending is growing just by about 5 % (Lorenzts-Augify 2013).

Big data are also a potential booster for the economy, bearing a \$ 300 billion potential annual value to US health care, as well as a \$ 600 billion potential annual consumers' surplus from using personal location data globally and a € 250 million potential annual value to European public administration. For instance, the European Commission is adopting an open data strategy, (i.e. a set of measures aimed at increasing government transparency) and estimated to create a € 32 billion a year market for public data.

According to the McKinsey Global Institute (2011), the potential value of global personal location data is estimated to be \$ 700 billion to end users, and it can result in an up to 50 % decrease in product development and assembly costs. What is more important, the benefits of big data do not apply solely to big business and Fortune 500 companies. Instead, small and medium size enterprises (SMEs), family businesses, start ups, and entrepreneurs have the ability to use such massive amounts of information to provide a product or service tailored more specifically to their market, country, or region, using big data in very specific, niche ways to reach a more targeted audience. This is of particular importance for many economies of the world, where SMEs account for a vast majority of the local business economy (70 % in the USA, over 90 % in some European countries) (Steinberg 2013).

But what is the growth engine of big data? From one side more 'old world' data are produced through 'open governance' and digitisation. From the other side 'new world' data are created and continuously collected in domains such as 'in silico' medicine, 'in silico engineering', and Internet science (Berners-Lee et al. 2006). This is true also in humanities, such as in the case of the birth of computational social science, based on analysing digital traces and footprints coming from mobile phones and social networks (the so called 'digital shadow', Broster et al. 2011). All these developments are allowed by the rise of new technologies for data collection, the availability of more affordable analytic tools for modelling and simulation, and the emergence of cloud-based services that accurately monitor, track, and provide localised data.

However, current research in the field is limited and emerging practice focuses mainly on the publication of open government data in machine-readable format, possibly through open standards. More innovative implementations include publication of linked data but little research is carried out in the broader governance context and especially with regard to the potential that open data (including linked

¹ An Exabyte is equivalent to one billion GB.

data), and especially big data could have if combined with policy modelling techniques and participative information and communications technology (ICT)-based solutions to gather inputs and feedback directly from citizens and other interested parties, so to ultimately improve the policy-making process in its various phases. And more important, as we record and generate a growing amount of data every millisecond, we also need to be able to understand this data just as quickly. From monitoring traffic to tracking epidemic spreads to trading stocks, time is of essence. A few delays in understanding information could cost not only money, but also lives.

The chapter is thus structured as follows: after having presented the rationale and methodological approach of the research (Section 2), in Section 3, it provides an overview of the state of play of big data techniques in relation to public governance. In the key findings of two in-depth case studies conducted as part of the CROSS-OVER project (see below) are discussed in relation to big data, while in Section 5, the key challenges that are derived and form part of the CROSSOVER's roadmap on Policy-Making 2.0 are discussed. The chapter concludes in Section 6 outlining policy implications and offering recommendations for future research directions in the domain.

2 Rationale and Methodology

The purpose of this chapter is to provide an overview of the current debate and state of the art in the domain of big data aiming at assessing the current and potential use of ICT tools for collaborative governance and policy modelling for opening up government operations and enhance the 'intelligence' of the policy-making process.

Within this context, big data refer to dataset that cannot be stored, captured, managed, and analysed by means of conventional database software. Thereby, big data are a subjective rather than a technical definition, because it does not involve a quantitative threshold (e.g. in terms of terabytes), but instead a moving technological one. Keeping that in mind, the definition of big data does not merely involve the use of very large data sets, but concerns also a computational turn in thought and research (Burkholder 1992).

From a practitioner's perspective, big data are also defined according to five dimensions, known as the five Vs: (a) Volume (as of 2012, about 2.5 EB of data are created each day, and that number is doubling every 40 months or so, thus bringing to consider as unit of measure for big data, the Zettabyte, equivalent to a billion Terabyte), (b) Velocity (which refers to the speed of data creation, the rate of data arrival, and action timing for its use for decision-making), (c) Variety (as there is heterogeneity of data types and representation as well as their semantic interpretation, since big data take the form of messages, updates, and images posted to social networks; reading from sensors; GPS signals from mobile phones, and more), (d) Variability (as data varies in terms of quality and structure), and (e) Virality (as data

spread in a viral manner across the Internet) (Gartner 2011; McAfee and Brynjolfsson 2012; Vercellis 2013).

Within this context, as stated by Latour (2009), when the tool is changed, also the entire social theory going with it needs to be different. In this view, big data are emerging as a system of knowledge that is already changing the objects of knowledge itself, as it has the capability to inform how we conceive human networks and community.

As argued by Lazer et al. (2009), not only we are offered the possibility to collect and analyse data at an unprecedented depth and scale, but also there is a change in the processes of research, the constitution of knowledge, the engagement with information, and the nature and the categorisation of reality. Big data could thus create a radical shift in how we think research itself, as well as we operate businesses.

But why does big data matter in governance and policy-making?

Big data can have a huge impact as its benefits can apply to a wide variety of policy areas: in health care, making care more preventive and personalised by relying on a home-based continuous monitoring, thereby, reducing hospitalisation costs while increasing quality, anticipating the detection of infectious disease outbreaks and epidemic development (e.g. McKinsey 2013); in education, by collecting data on students' performance, which is made possible, thanks to massive web deployment of educational activities, it would be possible to design more effective approaches (CCC 2012); in urban planning, where huge high fidelity geographical datasets describing people and places are generated from administrative systems, cell phone networks, sensors, or other similar sources; for intelligent transportation and energy efficiency systems, based on the analysis and visualisation of road network data, so as to implement congestion pricing systems and reduce traffic, or through the use of ubiquitous data collection exploiting sensors networks so to improve environmental modelling and to analyse energy pattern use through data analytics and smart meters, which can be useful for the adoption of energy-saving policies avoiding blackouts and improving energy savings (CCC 2012).

Big data can also be used in many other sectors of relevance for public governance. For instance, the availability and in-depth 'real time' investigation of big data could facilitate the integrated analysis of contracts in order to find relations and dependencies among financial institutions in order to assess the financial systemic risk of banks and financial institutions (Cerutti et al. 2012). The analysis of conversation in social media and networks, as well as the analysis of financial transaction carried out by alleged terrorists, could be used for preventing crimes and be used for homeland security (Azad and Gupta 2011). The assessment of computer security through analysis of security information and event management can also be better enabled by using big data analytics (UN Global Pulse 2012).

Analysing big data can also help in keeping better track of food and pharmaceutical production and distribution chains, as well as collecting data on water and sewer usage in order to reduce water consumption by detecting leaks. The use of sensors, GPS, cameras, and communication systems for crisis detection, management and response as well as, for carbon footprint management can also generate

important information and insights for better policy-making in these domains (UN Global Pulse 2012).

The chapter is based on current research conducted by the authors as part of the CROSSOVER project: Bridging Communities for Next Generation Policy-Making, an FP7 funded support action of the European Commission, whose main goal is to reach out to and raise the awareness of users, particularly government's practitioners and policymakers, while developing a research roadmap for establishing the scientific and political basis for long-lasting interest and commitment to next generation policy-making. In particular, the chapter presents an analysis of a selected number of cases in order to identify the characteristics and benefits resulting from applications of big data techniques and methodologies within the context of ICT solutions for collaborative governance and policy modelling.

This analysis is a part of the roadmapping exercise conducted as part of the CROSSOVER project, with specific regard to the implications of big data on the research challenge defined as 'Data-Powered Collaborative Governance' of the Policy-Making 2.0 roadmap, which aims to provide an outline of what technologies are available now for policymakers to improve their work, and what could become available in the future (CROSSOVER 2012a).

3 State of Play of Big Data Techniques in Relation to Public Governance

As we have mentioned above, the definition of big data does not involve a quantitative threshold (e.g. in terms of terabytes), but instead a moving technological one. Keeping that in mind, the definition of big data in many sectors ranges from a few terabytes² to multiple petabytes³, and it does not merely involve the use of very large data sets, but also concerns a computational turn in thought and research (Burkholder 1992).

Techniques and methodologies to support big data analytics and related modelling, and simulation for enhancing insight and improving decision-making are now becoming mainstream in the private sector (see for instance McKinsey 2013b with regard to R&D in the pharmaceutical sector) and starting to be used also in the public governance realm.

However, despite in the business press there are plenty of anecdotes and case studies to show the potential of big data and the value of being data driven, evidence of the effective impact and the conditions for success of data-driven strategies in the area of big data is lacking.

Only recently, in 2012, a team from the MIT Center for Digital Business, working in partnership with McKinsey's business technology office and researchers from Wharton, have conducted research to demonstrate the positive performance of US

² 1 TB is equal to 1 trillion bytes.

³ 1 PB is equal to 1000 TB.

data-driven companies in comparison with more traditional business-lead activities. Conducting structured interviews with executives at 330 public North American companies about their organisational and technology management practices, and gathering performance data from their annual reports and independent sources, the study showed that the more companies characterised themselves as data driven, the better they performed on objective measures of financial and operational results. In particular, companies in the top third of their industry in the use of data-driven decision-making were, on average, 5 % more productive and 6 % more profitable than their competitors. This performance difference remained robust after accounting for the contributions of labour, capital, purchased services, and traditional information technology investment. It was statistically significant and economically important and was reflected in measurable increases in stock market valuations (McAfee and Brynjolfsson 2012). This is to say that despite the issue of big data, it has been around since few years now, there is still little knowledge of the conditions and determinants for its application, especially in public policy domain, where the ‘performance’ cannot be simply accounted for increased revenue or sales.

Nevertheless, a growing body of research, at the intersection between technology, innovation, and governance—*latu sensu*—is emerging and exploring how big data analytics and ICT tools for modelling, simulation, and visualisation can best be exploited to make ‘policy-making’ possibly more ‘intelligent’. For instance successful examples of using big data in the private sector such as to improve airline estimated time of arrivals or increase the speed of analysis for providing personalised promotion in retailers companies, are starting to be analysed in depth. Moreover, experiments using data generated in cities worldwide are providing insights on how information available in the ‘intelligent environment’ we are living in everyday, could be exploited to increase public service delivery.

Many big questions remain however, open, and as Byrnes (2012) anticipated, despite big data are the breaking news in the ICT world since sometimes now, it is still not clear if it is just a big opportunity or a big headache. Indeed, the opportunities are emerging but these should be accompanied by clear indications on what to do, and how, in order to avoid it to be turned into a terrible headache, especially for decision-makers, in both the private and public sector.

In order to address this issue, in the following section, we report some examples of applications of big data in governance and policy-making where the predictive power of data can be applied to a wide variety of public policy issues, showing the growing body of evidence that is now highlighting the importance for public governance of big data techniques and methodologies mainly used in traditional hard science and business.

For instance, a research team from Northwestern University⁴ was able to *predict people's location* based on mobile phone information generated from past movements. Moreover, Pentland from MIT⁵ conducted a research showing that mobile phones can be used as sensors for *predicting human behaviour and mobility*, as they

⁴ <http://online.wsj.com/article/SB10001424052748704547604576263261679848814.html>.

⁵ http://www.nytimes.com/2011/04/24/business/24unboxed.html?_r=1&src=tpw.

can quantify human movements in order to explain changes in commuting patterns given, for example by unemployment.

Big data can be used for making *health care more preventive and personalised* by relying on a home-based continuous monitoring, reducing hospitalisation costs while increasing quality (McKinsey 2013a). Online data can be used for syndromic surveillance, also called infodemiology⁶. As an example, Google flu trends is a tool based on the prevalence of Google queries for flu-like symptoms. As shown by Ginsberg et al. (2009),⁷ it is then possible to use search queries to detect influenza epidemics in areas with a large population of web search users. In fact, according to the US Centre for Disease Control and Prevention (CDC)⁸, a great availability of data coming from online queries can help to detect epidemic outbursts before laboratory analysis. Another related tool is the Google dengue trend. In this view, the analysis of health-related tweets in the USA by Paul and Dredze (2011) found a high correlation between the modelled and the actual flu rate. In the same way, Twitter's data can be analysed to study the geographic spread of a virus or disease⁹. Finally, Healthmap¹⁰ is an interesting example in which data from online news, eyewitness reports, expert-curated discussions, and official reports are used to get a thorough view of the current global state of infectious diseases, which is visualised on a map (Freifeld et al. 2008).

On a different topic, considering that the world population will approach nine billion by 2050, there is the necessity to put in place policies aimed at ensuring a sufficient and fair distribution of resources, as the world food production will have to grow by 60 % by increasing the agricultural production and fighting water scarcity. An online data portal to be launched by the Food and Agriculture Organization of the UN (FAO) aims at enhancing decision-makers' capacity to estimate agricultural production potentials and variability under different climate and resources scenarios. Within this context, big data can be used for *ensuring better track of food and pharmaceutical production and distribution chain* (UN Global Pulse 2012).

In the last UN conference on climate (COP 17) taking place in 2011, the European Environment Agency, the geospatial software company Esri, and Microsoft presented the network Eye on Earth¹¹, which can be used to create an online site and group of services for scientists, researchers, and policymakers in order to share and analyse environmental and geospatial data¹². Moreover, during 2010 UN cli-

⁶ <http://yi.com/home/EysenbachGunther/publications/2006/eysenbach2006c-infodemiologyamia-proc.pdf>.

⁷ http://static.googleusercontent.com/external_content/untrusted_dlcp/research.google.com/en/us/archive/papers/detecting-influenza-epidemics.pdf.

⁸ <http://www.cdc.gov/ehrmeaningfuluse/Syndromic.html>.

⁹ <http://www.ncbi.nlm.nih.gov/pubmed/21573238>.

¹⁰ <http://healthmap.org/en/>.

¹¹ <http://www.eyearth.org/>.

¹² Other three projects launched by these institutions at COP 17 include WaterWatch (using EEA's water data); AirWatch, (about EEA's air quality data); and finally NoiseWatch, which is a combination between environmental data with user-generated information provided by citizens.

mate meeting (COP 16), Google launched its own satellite and mapping service Google Earth Engine¹³, which is a combination of a computing platform, an open API and satellite imagery along 25 years. All these tools are made available to scientists, researchers, and governmental agencies for *analysing the environmental conditions in order to make sustainability decisions*. In this connection, the government of Mexico created a map of the country's forest incorporating 53,000 Landsat images, which can be used by the federal authority and NGOs to make decisions about land use and sustainable agriculture. Other possible uses of big data in this context involve collecting data on water and sewer usage in order to reduce water consumption by detecting leaks, and using sensors' data for carbon footprint management (Kalakota 2012).

Sensors, GPS, cameras, and communication systems can be used for *crisis detection, management, and response*. For example, in occasion of the Haiti earthquake¹⁴, a team from the European Commission's Joint Research Centre used the damage reports mapped on the Ushahidi-Haiti platform¹⁵ to show that these crowd-sourced data could help predicting the spatial distribution of structural damage in Port-au-Prince. Their model based on 1,645 SMS reports/crowdsourced data almost perfectly predicts the structural damage of most affected areas reported in the World Bank-UNOSAT-JRC damage assessment performed by 600 experts from 23 countries in 66 days based on high-resolution aerial imagery of structural damage.

An inspiring example is given by Global Pulse, which is a big data-based innovation programme fostered by the UN Secretary-General and aimed at *harnessing today's new world of digital data and real-time analytics in order to foster international development*, protect the world's most vulnerable populations, and strengthen resilience to global shocks¹⁶.

Other examples of governments' commitment to *big data for national security* are represented by the Cyber Insider Threat (CINDER)¹⁷ program, which aims at developing new ways for detecting cyber espionage activities in military computer networks and at increasing the accuracy, rate, and speed with which cyber threats are detected; and the Anomaly Detection at Multiple Scales (ADAMS)¹⁸ program, led by the US Defence Advanced Research Project Agency (DARPA), which addresses the problem of anomaly detection and characterisation in massive data sets. Finally, the Centre of Excellence on Visualization and Data Analytics (CVADA) of the Department for Homeland Security (DHS) in the USA is leading a research effort on data that can be used by first responders to tackle with natural disasters

¹³ <http://earthengine.google.org/#intro>.

¹⁴ <http://publications.jrc.ec.europa.eu/repository/handle/111111111/15684>.

¹⁵ <http://haiti.ushahidi.com/>.

¹⁶ The programme encompasses five main projects carried out with several partners. See more at: <http://www.unglobalpulse.org/about-new>.

¹⁷ http://www.darpa.mil/Our_Work/12O/Programs/CyberInsider_Threat_%28CINDER%29.aspx.

¹⁸ http://www.darpa.mil/Our_Work/12O/Programs/Anomaly_Detection_at_Multiple_Scales_%28ADAMS%29.aspx.

and terrorists' attacks, by law enforcement to border security concerns, or to detect explosives and cyber threats (DARPA 2012).

4 Needs and Use of Big Data in Governance and Policy-Making; Findings from In-Depth Analysis of Case Studies

Within the scope of the CROSSOVER project, the European Commission's Joint Research Centre, Institute for Prospective Technological Studies (JRC-IPTS), in collaboration with a team of experts of the National Technical University of Athens (NTUA) carried out the activity of mapping and identification of case studies on ICT solutions for governance and policy modelling (CROSSOVER 2013).

The research design envisaged a set of macro phases. The initial phase consisted in the creation of a case study repository through the identification and prioritisation of potential sources of information, an open invitation for proposal of cases, followed by the definition of criteria for selecting at least 20 practices and the information-oriented selection of the corresponding case studies. In the second phase, case studies have been elicited through the definition of a second set of criteria for selecting eight promising practices and the application of a multi-criteria method. In the third phase, the final four cases have been selected and subjected to an in-depth analysis carried out through meticulous study of the available public documentation and the conduction of interviews with the key involved stakeholders. After the final selection of cases and the in-depth analysis, the findings have been synthesised through the analysis of the emerging trends from applications of ICT solutions for governance and policy modelling as well as the development of key considerations for the CROSSOVER roadmap for the themes that refer to its scope. Finally, the findings have been shared with the CROSSOVER partners and the Policy-Making 2.0 community.

In order to proceed to the selection of the candidate cases, a multi-criteria methodology has been used (DETR 2002) to prioritise the cases on the basis of the specific criteria for judging their relevance and maturity in order to be used at the next steps of the study¹⁹.

The analysis of the cases was performed not only through desk-based research but also through direct exchanges with selected members that have been involved in each case study in order to verify advertised results and to acquire more information (such as impact, usefulness, drawbacks, advantages, business opportunities, etc.).

Out of the four cases analysed in depth, two of them are specifically related with the topic of big data under investigation, and thus, we provide here a summary of the main results.

¹⁹ The multi-criteria method selected and applied for prioritising the cases is based on the Analytic Network Process (ANP) (Saaty 1996), a more general form of the well-known Analytic Hierarchy Process (AHP), (Saaty 1980) used in multi-criteria decision analysis (Belton and Stewart 2002).

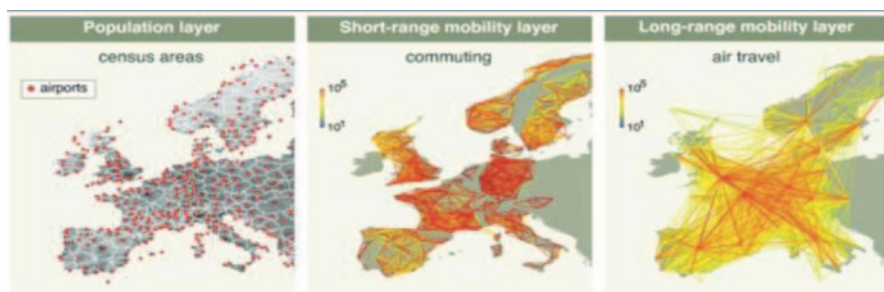


Fig. 1 The three populations and mobility data layers in GLEAM

GLEAM—The global epidemic and mobility model,²⁰ is a discrete stochastic epidemic computational model based on a meta-population approach in which the world is defined in geographical census areas connected in a network of interactions by human travel fluxes corresponding to transportation infrastructures and mobility patterns. Its simulation engine includes a multi-scale mobility model²¹ integrating different layers of transportation networks going from the long-range airline connections to the short-range daily commuting pattern²² and it elaborates stochastic infectious disease models to support a wide range of epidemiological studies, covering different types of infections and intervention scenarios in order to respond to the spread of a pandemic crisis in short time. Real-world data on population and mobility networks are used and integrate those in structured spatial epidemic models to generate data-driven simulations of the worldwide spread of infectious diseases (Fig. 1).

GLEAM is mostly used in the design stage of the policy-making cycle, and it is able to manage and visualise with a huge amount of complex and diverse data. In fact, data from census agencies, data regarding population at very high resolutions, data from a world map implemented by NASA, the entire database of airlines, about 40 databases from different countries for local mobility are utilized. In the H1N1 epidemic case, the simulation derived from the application of GLEAM was used *ex post* and resulted in a particularly accurate analysis. GLEAM is nowadays utilised both in research initiatives (e.g. EPIWORK IP project²³, EPIFOR project²⁴) and in formal policy-making agencies (e.g. US Defense Agency).

UrbanSim²⁵ is a software-based demographic and development modelling tool for integrated planning and analysis of urban development, incorporating the interactions between land use, transportation, environment, economy and public policy

²⁰ <http://www.gleamviz.org/>.

²¹ <http://www.gleamviz.org/model/>.

²² GLEAM in detail. Available at: www.GLEAMviz.org/GLEAM-in-detail/.

²³ EpiWork: Developing the framework for an epidemic forecast infrastructure. Available at: <http://www.epiwork.eu>.

²⁴ EpiFor: Complexity and predictability of epidemics: toward a computational infrastructure for epidemic forecasts. Available at: <http://www.epifor.eu>.

²⁵ <http://www.urbasim.org>.



Fig. 2 UrbanSim land maps

with demographic information. It simulates in a 3D environment the choices of individual households, businesses, and parcel landowners and developers, interacting in urban real estate markets and connected by a multimodal transportation system. The 3D output resulting from the process underpinning the simulation model is presented using indicators, which are variables that convey information on significant aspects of the simulation results (Fig. 2).

This approach works with individual agents as done in agent-based modelling, and with very small cells as in the cellular automata²⁶ approach, or even at building and parcel levels. UrbanSim, however, differs from these approaches by drawing together choice theory²⁷, a simulation of real estate markets and statistical methods in order to achieve accurate estimation of the necessary model parameters (such as land policies, infrastructure choices, etc.) in order to calibrate uncertainty in its system. As an example of its use, one could refer to the project on modelling land use change in Chittenden county²⁸, where the model parameters based on statistical analysis of historical data are integrated with market behaviours, land policies, infrastructure choices in order to produce simulations on household, employment, and real estate development decisions (where the first two are based on an agent-based approach while the latter on a grid-based approach).

UrbanSim has proved its acceptance by the targeted end users as it has been already applied in many cases (mostly in the USA), including Eugene-Springfield-Oregon, Detroit-Michigan, Salt Lake City-Utah, San Francisco-California, and Seattle-Washington. In Europe, applications of the UrbanSim system include the cities

²⁶ http://en.wikipedia.org/wiki/Cellular_automaton.

²⁷ http://en.wikipedia.org/wiki/Choice_theory.

²⁸ <http://www.uvm.edu/rsent/countymodel/Workshop08bv3.ppt>.

of Brussels, Paris, and Zurich. Nevertheless, UrbanSim, as still being a research initiative, is also very active in the field of research (i.e. SustainCity FP7 project²⁹).

UrbanSim is now exploring applications in transportation and land use domains, as well as urban design. Environmental issues (e.g. greenhouse gas emissions) were a motivation to some projects (such as UrbanSim for Canada³⁰). Energy consumption and/or water consumption as well as the impact of climate change (e.g. on weather) are also a topic of interest.

5 Implications of Big Data on Policy-Making 2.0

From the analysis conducted, it appears clear that in order to enjoy all the potential stemming from big data it would be necessary to remove the technological barriers preventing the exchange of data, information, and knowledge between disciplines, as well as to integrate activities which are based on different ontological foundations. Even though big data are expected to provide huge benefits, many challenges are still to be coped with. As we have seen, challenges in this field are not only given by the volume of data but also by its velocity, variety, variability, and virality. According to recent research, (GRDI 2020 2010) and as key research gaps identified as a part of the CROSSOVER roadmapping exercise (CROSSOVER 2012a), the main challenges linked to big data in the policy-making arena include the following:

- **Data modelling challenges:** Data models coherent to the data representation needs and able to describe discipline specific aspects are lacking. At the same time, data models for representation and query of data provenance and contextual information, languages representing and managing data uncertainty, and representing and querying data quality information also need to be enhanced.
- **Data management challenges:** It is necessary to provide quality, cost-effective, reliable preservation, and access to data, as well as to protect property rights, privacy, and security of sensible data, ensuring that data search and discovery across a wide variety of sources is maintained, and that data sets from different domains are connected in order to create open-linked data space (unstructured or semi-structured). Different data format, or labels used for same elements, as well as diverse data entry conventions and vocabularies used need to be reconciled, because big data sets can be so large and they cannot be effectively processed by a single machine, thus requiring data and task parallelisation.
- **Data service/tools challenges.** Data analytics tools for most scientific disciplines are inadequate to support research in all its phases. Therefore, scientists are often less productive than what they might be. This brings upfront a pressing need of making available ICT tools able to ‘clean’, analyse, and visualise huge

²⁹ <http://www.sustaincity.org/>.

³⁰ <http://res.ca/UrbanSim/UrbanSimIntro.htm>.

amounts of data, as well as data tools and policies for ensuring cross collaboration and fertilisation among different disciplines and scientific realms.

In addition to the key challenges identified by CROSSOVER, as stated by Boyd and Crawford (2011), the following issues need to be highlighted:

- **Relationship between automatic search and the definition of knowledge.** At the beginning of the twentieth century, Ford introduced the mass production, automation, and assembly line, reshaping not only the way things are produced but also the general understanding of labour, the human relationship to work, and the society at large. In the same way, big data are a new system of knowledge characterised by a computational turn in science leading to a change in the constitution of knowledge, the process of research, and the categorisation of reality. Big data, as a new system of knowledge can change the very meaning of learning itself, with all the possibilities and limitations embedded in the systems of knowing.
- **Big data may produce misleading claims of objectivity and accuracy.** In science, there is a deep cleavage between qualitative and quantitative scientists. Apparently, qualitative scientists would be engaged in creating and interpreting stories, while quantitative scientists would be in the business of producing facts. Needless to say, that is not the case as all the objectivity claims come from subjects, who make subjective observation and choices. Moreover, data analysis is based on tons of assumptions and the final interpretation is subjective. Other examples are the difficulty of consistently integrating different datasets and the fact that Internet databases may be affected by frictions and self-selection. In this view, big data might support objectivity and accuracy claims which are not really grounded on good sense and reality.
- **A higher quantity of data does not always mean better data.** In all sciences there is a massive amount of literature aimed at ensuring the consistency of data collection and analysis. Big data scientists instead assume an a-priori quality of their data and completely neglect the methodological issues related to data quality. A clear example is given by social media data, which are subject to self-selection bias. Even the definition of active user might not be innocuous, as 40 % of Twitter's users are not proactive. Finally in some contexts, high-quality research is purposely carried out with a limited amount of data, such as for instance in game theory experimental analysis. This means that even though big data enable managers and decision-makers to decide on the basis of evidence rather than just intuition, the quality of the scientific evidence need to be controlled and the assumptions underlying the research results need to be made clearly intelligible.

Other important aspects that need to be considered (see GRDI 2020 2010), especially with regard to the use of big data in research, to support evidence-based policy-making are the following:

- **Big Data and Ethical Issues.** The use for research purposes of 'public' data on social media opens the door to deontological issues. Can those data be used without any ethical or privacy consideration? How the researchers can be sure that their activity is not harmful for some of their subjects? On one hand it is impossible to ask for data use permission from all the subjects present in a database. On

the other hand, the mere fact that the data are available does not justify their use. Accountability to the field of research and accountability to the research subjects are the ethical keys for big data.

- **Digital divides created by Big Data.** It is widely accepted that doing research on big data automatically involves having a quick and easy access to databases. This is not the case, as only social media companies have access to large datasets, and sell those data at a high price, offering only small data sets to university-based researchers. So, researchers with a considerable amount of funding or based inside those firms can have access to data that the outsiders will not. Big data can create a new digital divide, between researchers belonging to the top universities and working with the top companies, and scholars belonging to the periphery. But the digital divide can be also skill based: In fact only people with a strong computational background are able to analyse massive quantities of data.

Finally, some technical and legal challenges need to be mentioned here, though it would be out of the scope of this chapter to go into much detail here.

These can be divided along two main dimensions. On one side, there are issues related to *data management*, such as: (a) *Privacy*, as clearly the development of new technologies always raises concerns for personal data protection of individuals, companies, and societies. In the era of big data, the primary producers, who are the citizens using services and devices generating data, are seldom aware that they are doing so or how their data will be used. Sometimes it is also unclear to what extent users of social media such as Facebook or Twitter consent to the analysis of their data. The pool of individual information shared by mobile phones and credit card companies, social media and research engines is simply astonishing. People must be conscious of that as privacy is a freedom pillar of any democratic society, (b) *Access and sharing*: A great amount of data are available online for the most disparate uses while much data are retained by companies which are concerned about their reputation, the necessity to protect their competitiveness, or simply lack the right incentive to make them accessible. On the other hand, there are a bunch of technical and regulatory arrangements which have to be put in place in order to ensure inter-comparability of data and inter-operability of systems. The debate on these issues from a technical and legal perspective is still in its infancy, and at present it is not clear if in the future the ‘open world or the closed world’ will prevail (see on this also Misuraca et al. 2011).

On the other side, there are issues of *data analysis*, which concern (a) *Data summarising*, as sometimes data might be simply false or fabricated, especially with user-generated text-based data (e.g. blogs, news, social media messages), or data may derive from people’s perceptions, as in calls to health hotlines and online searches for symptoms. Another case is related to techniques of opinion mining and sentiment analysis, in which the true significance of the statements can be misled, so that the human factor is always crucial in the analysis, and (b) *Data interpretation*: A very important concern is given by the sample selection bias, given by the fact that people generating data are not representative of the entire population. In this way, the conclusions of analysis are valid only for the sample at hand and cannot therefore be generalised. Sometimes dealing with huge amounts of data leads

the researchers to focus on finding patterns or correlations without concentrating on the underlying dynamics. One thing is to find a correlation, another is to detect a causal relationship.

6 Conclusions: Future Research and Policy Implications

From the analysis carried out, some common messages can be identified. First of all, it is clear that the emerging world of big data are characterised by heterogeneity and incompleteness; therefore, data must be structured in a homogeneous way prior to be analysed. An efficient representation, access, and analysis of semi-structured data is necessary because even after cleaning and error correction in database, errors and incompleteness remain, challenging the precision of analysis. In addition to that there are still many realms in which the human factor is needed to be able to discover patterns algorithms cannot find. In this view, a big data system must involve a human presence and there is the necessity to harness human ingenuity from different domains through crowdsourcing mediating conflicting statements and judgments, which are normal practice when it comes to governance and policy-making.

Future research topics include: data warehouse, pivotal transformation, ETL, I/O, efficient archiving, storing, indexing, retrieving and recovery, streaming, filtering, compressed sensing sufficient statistics, automatic data annotation, large database management systems, storage architectures. Moreover, technologies for summarising data and extracting meaning from the confusion of big data are required: automatic reporting, dashboards, Bayesian techniques, scalable and interactive data visualization, extraction and integration of knowledge from massive, complex, multimodal, unstructured, or dynamic data, data-driven high fidelity simulations, scalable machine learning, predictive modelling. Last but not the least, the field of research addressing technologies for using data as decision-making tools is becoming crucial, and includes areas such as Decision Trees, Pro-Con Analysis, Rule-Based Systems, Neural Networks, Trade-off based Decisions.

From a policy oriented and practitioners' perspective, the cases analysed show that the power of high-quality data at an appropriate level and the format to be incorporated into policy models is indisputable. Open and big data have been exploited to a certain extent in the cases investigated and reported in this chapter (i.e. GLEAM and UrbanSim). However, findings from the cases confirm that their use for policy-making is often accompanied by some scepticism or too much enthusiasm. Interaction with social media is limited to publishing relevant stories in the user's social media accounts while a more efficient exploitation of social data is envisaged as crucial for future research in most of the cases identified. As preliminary conclusions of the analysis conducted show that no matter how well defined or detailed a policy model or analytic tool is, high-quality data represent the holy grail of policy-making. Particular attention thus needs to be given to collect, filter, curate, and intelligently tap bottom-up data, available from multiple sources. As current policy-making cases typically struggle to cope with too much or too little

data at the appropriate level, reliable data sources need to be foreseen from the very beginning and incorporated in policy models in a real-time manner to allow informed decisions.

This last consideration brings us to the critical aspect of governing big data. In fact, although it seems now evident that data-driven decisions are better decisions (as stated by McAfee and Brynjolfsson 2012), a new culture of policy-making is yet to emerge to face the managerial and organisational challenges linked to using big data. As shown by the survey of users' needs, big data and analytics, including ICT-based modelling, simulation, and visualisation have rocketed to the top of the corporate and policy agendas. On one side, executives look at how Google, Amazon, and others have eclipsed competitors with new business models deriving from the ability to exploit data (Barton and Court 2012); on the other side, policy-makers are more and more attracted by evidence-based policy-making, and in search of the 'right model' to equate big data with big solutions for society. But this attraction could become a fatal one if it is not well managed. Indeed, big data and advanced ICT solutions for governance and policy modelling are becoming more and more available, and they may well be a decisive asset in support of policy-making, however, it would be a mistake to assume that acquiring the right kind of big data (or even the more advanced modelling tools) is all that matters. More important it is to accompany the process with an adequate transformation of the organisational culture and governance structure, enabling a real shift toward a new generation of data and evidence powered collaborative governance and policy-making.

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Disclaimer The views expressed in this paper are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

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Open Government Collaboration

Opportunities and Challenges of Open Collaborating With and Within Government

Jörn von Lucke and Katharina Große

1 Introduction: Taking Collaboration to the Next Stage(s)

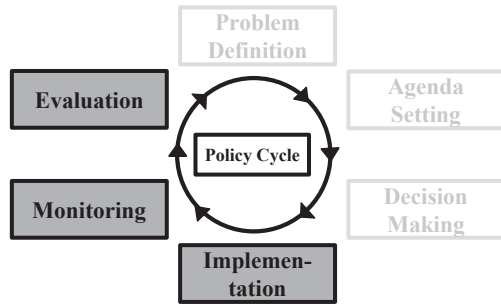
While not necessarily being a new concept, the opening up to and the inclusion of the citizen has been rediscovered and rebranded in recent years: Open government is ubiquitous in the debate about politics and administration. Under the roof of the Open Government Partnership, 55 countries committed themselves to achieving “institutions that empower citizens and are responsive to their aspiration” (OGP 2012). In Germany too, politicians and administrators are starting to realise the importance of opening their processes. Recently, a national cross-government data portal was launched.¹ A cornucopia of e-participation projects has been carried out on local, state, and federal levels. However, all efforts are focused on the decision preparation in policy-making. The potential of opening the post-decision processes is largely unrecognised by both practitioners and academics. This is what this chapter strives to change. It will analyse the potential of opening up the latter stages of the policy cycle: implementation, monitoring, and evaluation (Fig. 1). This open government collaboration (OGC) does not only encompass the involvement of citizens, but also the collaboration of different administration units. In the following sections, firstly, the general concept of collaboration and its developments will be introduced. Secondly, different practical applications for administration will be presented and analysed. A conclusion will be followed by recommendations for the implementation of OGC.

¹ <https://www.govdata.de>.

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Fig. 1 OGC stages of the policy cycle



2 The Concept of Collaboration

The term collaboration describes the co-ordinated approach of people or organisational units to work together to achieve commonly set goals. Two trends are influencing government collaboration: electronic collaboration and open collaboration. These lead to two specific manifestations of open collaboration that are of special interest for governments: outsourcing and crowdsourcing.

E-Collaboration

Recent developments in information and communication technologies (ICT) have greatly enhanced the possibilities for collaboration. Soft- and hardware augment traditional processes. Enabled by the Internet, project teams can work together independent of location or time differences. They can manage tasks, coedit documents or co-programme. With the advance of Web 2.0, the necessary tools have become easy to handle for non-expert users. The global diffusion of social media like Facebook, Google+, and Twitter has facilitated communication and collaboration: Information can reach a nearly unlimited numbers of recipients in near real-time.

Open Collaboration

E-Collaboration enables teams and organisations to open up their processes like never before: External actors can be involved in communication or in task fulfilment. Via the Internet, interested stakeholders follow the course of actions. High-quality contributions might advance the problem-solving process. New collaborators can take part in co-production. The networks output can be increased without overwhelming the organisation's own capacities.

Outsourcing: Profiting from the Expertise of a Chosen Few

The first possibility to open up an organisation for collaboration is outsourcing: the collaboration with carefully chosen partners. Administrations have been practising outsourcing in so-called shared service centres—internal agencies that provide services for more than one administration (Hensen 2006; Fiedler et al. 2009). Outsourcing to external partners is conducted through a bidding process. While this form of collaboration is not necessarily new, it is fostered and facilitated by the IT-developments helping open collaboration. Also, new forms of outsourcing arise, like the provision of cloud services.

Crowdsourcing: Profiting from the Power of the Mass

The opening towards external actors, aided by new ICTs, creates another powerful collaborator: the crowd. The basic idea is to outsource parts of an organisation's process chain to the intelligence and manpower of a heterogeneous mass of undefined size on the Internet (crowd), which is constituted by volunteers that are—in many cases—willing to work without compensation. A large group might be capable of solving complex problems that smaller teams would not be able to tackle. Together, they might write content and code, or generate impulses for innovation. Currently, an infrastructure of intermediary platforms and crowd recruiters is starting to take form. The key factors of success for all crowdsourcing (outsourcing to the crowd) will be to provide attractive incentives and motivators, and to have reliable infrastructure, offering an attractive mix of experts, engaged citizens, and crowd managers (von Lucke 2010, p. 4; Hoßfeld et al. 2012, p. 204; Hammon and Hippner 2012, p. 165).

3 Open Government Collaboration

It has been shown that open collaboration offers a great potential for any organisation. Fixed costs can be decreased; complex problems can be solved. Innovation could thrive. Why then should not governments profit from this new resource too? In some instances, it already does. Much is written about third-party involvement during the first stages of the policy cycle (Fig. 1) and it is in the focus of many current research projects.² This open participation, or e-participation, encompasses all roundtables, consultations, and mediations to jointly solve problems and prepare decisions. There is thus no need to add more to this discussion. The latter stages of the policy cycle, however, namely implementing solutions, monitoring,

² Examples for e-participation research: Bertelsmann Stiftung (<http://www.buerger-beteiligung.org>), Ifib/zebralog (Albrecht et al. 2008).

Table 1 Forms of crowdfunding

Type	Repaid?	Reward	Application	Example
Donations	No	None	Charity	Betterplace.org
Support	No	Paraphernalia etc.	Culture	Startnext.de
Micro loans	Yes	None	Developing countries	Kiva.org
Loans	Yes	Interest	City projects	Leihdeinerstadtgeld.de
Investment	No	Company shares	(Social) start-ups	Seedmatch.de

and evaluating, are not as prominently discussed by policymakers and scientists (see figure 1). While there are several works that talk about collaboration, they mostly regard it as a variation of participation, often a more professional form of participation in problem solving that has actual influence on the decision-making in contrast to citizen consultations (Harrison et al. 2012; Noveck 2009). Others discuss aspects of collaboration in the latter stages, but single out applications like crowdfunding (Nath 2011) or peer review (Noveck 2009), or focus on inter-institutional collaboration only (Nath 2011),³ without providing a comprehensive framework. Linders (2012) is one of the few who proposed an inclusive concept that encompasses the design, execution, and monitoring of policies. While providing a good starting point, there is more potential for collaboration in the latter policy stages than Linders (2012) discusses in his paper. This is thus what this chapter will focus on: The collaboration during the implementation, monitoring, and evaluation of policies, which is called OGC.

4 Applications of Open Government Collaboration

In the subsequent paragraphs, ten areas of application of OGC will be presented in detail. They do not only concern citizen collaboration, but are also useful for the intra- or inter-administrational context.

Crowdfunding

Europe has recently faced severe budget cuts and austerity measures. Crowdfunding might provide a way out. Online crowdfunding platforms offer citizens the possibility to find (often a large number of) supporters that are willing to contribute partial funding to proposed projects. Commonly they will finance the undertaking. There are different types of crowdfunding, which differ in the rewards they offer fund-givers and the project types (Table 1). The first form of crowdfunding is a

³ Nath (2011) talks about collaborating with citizens too, but only on the level of collecting or commenting on ideas, which needs to be classified as participation, not collaboration in the here-proposed framework.

variation of the classical charitable donation, where no direct rewards are offered. In the case of cultural projects, the financial support is often rewarded/incentivised with special paraphernalia, behind the scenes insights, or similar. When it comes to loans, there is the typical microloan to support local start-ups or projects, mostly in developing countries. There is no interest or reward, but the loan is repaid after a period of time. However, communities in developed countries are starting to use crowdfunding, too. Leihdeinerstadtgeld.de is one of the first portals where cities can find lenders for communal projects. Loans are repaid and lenders earn interest. Finally, crowdfunding is used to help kick-start companies. Platforms like seedmatch.de bring together founders and potential investors, which obtain company share for their funds.

A slightly different, but related form of crowdfunding are citizen foundations. In Germany, citizens can start foundations to sustainably fund the fulfilment of voluntary public tasks.

The main advantages of crowdfunding are that, depending on the category, micropayments are possible or interest rates are attractive. Also, customer-orientation is high. Sponsors are directly linked to the projects and feel highly involved. This creates virtual trial runs for all ideas. Crowdfunding can significantly relieve the state budget and make possible the projects that otherwise would not attain funding. This might vitalise and strengthen the cultural communities, while at the same time improve their marketing skills. Private undertakers might continuously professionalise (Köpl 2012, p. 1 ff.). There are however, some inherent weaknesses. Crowdfunding is unsuitable for sovereign functions. It is a development towards cultural patronage, which is less foreseeable and sustainable than long-term political strategies. Additionally, its success strongly depends on the reliability of the platform managers and project initiators. Also, the legitimacy of crowdfunding platforms is unclear. It might face the risk of traditional institutions opposing its success, feeling threatened. If crowdfunding takes hold, the significance of the state's role diminishes, leading to a possible alienation. This might in return lead to further decreases in the public budget for arts and culture.

Collaborative Knowledge Management

Knowledge is the purposeful interconnection of data and information. It is the foundation of every organisation's skills to act competently and decide wisely (North 2002). Knowledge management tries to find the most effective way to attain, develop, transfer, store, and use knowledge (BMI 2012, p. 9). Examples such as wikipedia.org or openstreetmap.org have proven the great potential of collaborative knowledge management (CKM). On the one hand, CKM allows for more knowledge to be compiled, e.g. in topic-oriented or regional wikis, and commonly created educational resources. On the other hand, knowledge can be shared on open-data platforms and through APIs, and thus be improved due to public scrutiny. A major advantage of CKM is that it diversifies and broadens knowledge sources.

Also, it offers a systematic approach to compiling, processing, and storing data and information, which will lead to an increase in knowledge and competences. Mature tools are readily available, like knowledge budgets and knowledge controlling, which foster a rapid professionalisation. The digitalisation preserves knowledge independently from individuals. Open access enables people to control and improve information. Data can be reused and developed. This can lead to new databases or products that create competition for traditional suppliers. Globally accessible digital schools or academies might be created, as well as libraries and archives. Not only is this a democratisation of knowledge, it also offers a possible solution to cope with the demographic change and the entailed danger of losing valuable knowledge. Nonetheless, CKM entails some weaknesses. Firstly, technology allows only information and data to be stored. Knowledge itself, however, can hardly be documented. The effort to compile and document all information is high. It relies on the engagement of the contributors. Training and additional qualifications are necessary and there is no independent control process to guarantee quality. Finally, in contrast to commercial products, there is no business model attached. Funding needs to be achieved through donations or similar (e.g. crowdfunding) means. Further, individuals might be sceptic towards sharing their information. The acceptance of new tools might be low. There is the danger of contributors intentionally posting false or irrelevant information (spamming). The technical infrastructure might face security threats or overload. Finally, initiatives in favour of CKM might be opposed by companies, which perceive them as a threat to their business model. Also, traditional institutions, like libraries, might fear for their existence.

Collaborative Project Work in Virtual Workspaces

Projects are temporarily limited attempts to solve specific complex questions or react to current challenges. Project teams operate outside the usual organisational structures and are detached from the day-to-day operations (Schwarzer and Krcmar 2010, p. 114). New ICT developments allow projects to be opened up to external contributors. Cloud services and software for project management aid the co-ordination of teams⁴, facilitate brainstorming⁵ and planning⁶, or function as shared document repositories⁷, and collaborative editors.⁸ Virtual workspaces bundle the

⁴ For example: Microsoft (<http://office.microsoft.com/en-us/project/>), Asana (<http://asana.com>), Project libre (<http://projectlibre.org>). Overview: http://en.wikipedia.org/wiki/Comparison_of_project-management_software.

⁵ For example: MeetingSphere (<http://husung-partner.de>), Gliffy (<http://www.gliffy.com/>), Creatly (<http://creately.com/>), mindmeister (<http://www.mindmeister.com>), Webspiration (<http://www.my-webspiration.com/>), mind42 (<http://mind42.com/>).

⁶ For example: Doodle (<http://doodle.com>), Foodle (<http://terminplaner.dfn.de>).

⁷ For example: TeamDrive (<http://teamdrive.com>), Dropbox (<http://dropbox.com>).

⁸ For example: Google Docs (<http://docs.google.com>), Lucidchart (<https://www.lucidchart.com/>), Etherpad (<http://etherpad.org>), Overview: http://en.wikipedia.org/wiki/Collaborative_real-time_editor.

needed instruments.⁹ The platforms for software development are a special case of virtual workspaces and are mostly found in open-source development. Collaboration tools offer independence from location and time. Work is possible synchronously and asynchronously. Third-party actors can easily be included. Cloud services are available immediately. Comprehensive virtual workspaces offer a clearly defined project environment with automated documenting and reporting. This leads to great time-savings and allows teams to focus on their core activities. They often offer interfaces for the integration into administrative processes. Installing a virtual workspace provides a great opportunity to clarify the contributors' roles and responsibilities. Work efficiency of the project teams can be enhanced. The visualised collaboration and inclusion of external participants fosters creativity and innovation. It is possible to offer flexible working hours and locations, which is crucial to attract talent. On the downside, depending on the chosen product and configuration, the incurred costs and effort to customise the workspace and train personnel might be high. Interoperability and data protection could be an issue.¹⁰ The success of virtual workspaces might be threatened by lacking acceptance from the employees or external participants. There is a risk of creating parallel structures. Crucial information about innovations might be leaked and again, dependence on the technical infrastructure increases.

Open Committee Work

A large share of committee work is part of the parliamentary decision preparation, which is not in the focus of this chapter. Instead, the focus will be on committee reports, hearings, and evaluations. Open committee work has two manifestations. Firstly, it is concerned with informing the interested public about decisions and creating more transparency. Secondly, it deals with opening up the committee work for the active involvement of external actors. The former can be achieved by video or audio streaming¹¹ or the provision of open data platforms.¹² The latter might use wikis or pads to allow citizens to comment on the status of decision implementation. Also, reports might be co-produced by using collaborative editing software or similar tools.¹³ Open council information systems offer a comprehensive solution to open committee work. The strengths of open committee work lie in a near real-time flow of information and the external contributions to reports, monitoring, and evaluation. This might lead to a perceived increase in legitimacy and higher

⁹ For example: Microsoft Share Point or Office 365 (<http://office.microsoft.com/en-us/collaboration-software-sharepoint-FX103479517.aspx>). Overview: http://en.wikipedia.org/wiki/List_of_collaborative_software.

¹⁰ In Germany, for example, it is not compliant to use US cloud services (Weichert 2010).

¹¹ For example: Jena (<http://www.jenatv.de/Stadtrat.html>), Würzburg (<http://stadtrattv.de/tag/stadtrat-wuerzburg>).

¹² For example: Cologne (<http://offeneskoeln.de>), Frankfurt (<http://www.frankfurt-gestalten.de>).

¹³ For example: Enquetebeteiligung (<http://www.enquetebeteiligung.de>).

acceptance for committee decisions. Also it could improve the public's understanding of the political processes and strengthen their interest in committee work. The provided information might encourage follow-up projects or innovations. Be that as it may, the effort to co-ordinate all involved actors should not be underestimated. The same must be said about the costs for introducing the necessary platform of information system. As with all external contributions, there is no quality guarantee. Finally, restricted committees have to be exempt. The opening might be threatened by a fear of transparency and a lacking acceptance of external contributions by the committee members. There is a risk that pseudo-participation is created, which does not influence the committee work. Strict privacy regulation might provide a (necessary) hindrance. Of course, again, the technical infrastructure is liable to the aforementioned threats.

Collaboration Based on Joint Record Management and Transaction Processing

Joint record management and transaction processing is not a new concept in administration, but it can be significantly enhanced if digitalised and opened. Virtual workplaces offer a comprehensive solution. In order to be opened, process chains need to be broken down into task modules. Therefore, all processes must be defined and documented. If different systems interact, standardised interfaces are needed. In case of different inter-administration systems, there is a need for secure mailing and exchange. For the medium and long term, all systems must be set-up to interoperate on a European and global level. The strengths of collaborating electronically lie in the time and cost savings that are achieved because files and records can be accessed and processed from several workstations simultaneously. Also, files, records, and processes are traced automatically. They can be easily found due to the seamless electronic record management. Status information is available, and hence transparency is created. As data is encrypted, files transfer increases in security. E-records and digitalised process chains create an opportunity to optimise administrative processes and eliminate redundancies in record management. Decision-making might improve and valuable new (cloud) services might develop. If processes are opened to the citizens then malpractice, fraud, and corruption can be fought openly while the relationship to the public improves.¹⁴ A comprehensive switch to e-files and digital transaction processing would need the infrastructure to be in use with all relevant partners. The current distribution, however, is rather low. Also, the costs of implementation are not negligible. Defining and standardising all administrative processes will prove challenging. Initiatives such as the German National Process Library offer support.¹⁵ Finally, the opening of processes is limited by legally determined hierarchies and authorities. There is a danger that intentionally established barriers might be softened. Data protection is a key factor. Internally, there might be

¹⁴ A good example is set by Seoul, which opened its files and decreased corruption significantly (Lee 2003).

¹⁵ German National Process Library: <http://www.processlibrary.de>.

a high scepticism towards increased transparency and a reluctance to switch to new technologies. Further, the success of collaboration might be threatened if e-files and documents are not accepted as legally valid or if integration with other administrations fails. This holds especially true if international standards and regulations change. Finally, of course, all general threats to the IT security apply.

Collaborative Implementation of Mandatory Public Functions

Mandatory public functions (MPF) are functions whose fulfilment a state has to ensure. Collaboration might happen through shared service centres and points of single contact. Shared service centres can be established within administrations and with external providers (Hensen 2006; Fiedler et al. 2009). Points of single contact have been initiated by the Directive 2006/123/EC on services in the internal market (2006). Both require an infrastructure that enables access to many administrative units. This can be reached by virtual workspaces and digitalised transaction processing systems. There is, however, also a potential for real crowdsourcing in the fulfilment of MPFs. The Khan Academy is an example for the collaborative provision of schooling.¹⁶ However, most MPFs are unsuited for collaboration, especially if they are sovereign functions. However, if a state loses its capability to act, e.g. in the case of crises and disasters, the crowd might come to its aid. One prominent example is Haiti, where, after the 2010 earthquakes, a global crowd mapped destructions to enable aid organisations to co-ordinate.¹⁷ Several web-based tools have emerged since then, which are at the crowd's disposal.¹⁸ This might also hold true in the case of cyber-attacks. After the 2007 assaults on Estonia, a Cyber Defence Unit of volunteers has been formed (Czossek et al. 2011, p. 61). Embedded in a solid legal framework, collaboration on MPFs can create significant time and cost savings. It can maintain a state's ability to act in case of disaster, fasten relief, and improve logistics. Citizens might be mobilised and increase their engagement. They might generate innovative solutions. Administration could use freed resources to improve their problem-solution and innovation capabilities. However, the collaborative fulfilment on MPFs increases the administrations' dependence on external actors. Administration loses its organisational autonomy and there are no quality guarantees for external contributions. The provision of capacities is less reliable than when done by employees and the accountability is unclear. Also, the collaborative implementation targets digitally savvy citizens only. There is a risk of personal interests influencing the work and leading it into unwanted directions. Also, administrations risk losing the citizens' trust. They might consider the state incapable of fulfilling the necessary tasks on its own.

¹⁶ Khan Academy: <https://www.khanacademy.org>.

¹⁷ Haiti: <http://haiti.openstreetmap.nl>, http://wiki.openstreetmap.org/wiki/WikiProject_Haiti/Earthquake_map_resources.

¹⁸ For example: Crisis Mappers (<http://crisismappers.net>), Ushahidi (<http://www.ushahidi.com>), Google Crisis Response (<http://www.google.org/crisisresponse>).

Collaborative Implementation of Voluntary Public Functions

An even larger potential for collaborative action lies in the fulfilment of voluntary public functions (VPF). Not only in Germany, volunteering has a long and valued tradition, be it in the form of honorary positions or free-time volunteering. It can now be supported through volunteer portals, through which volunteers can be matched to projects and associations. Initiatives can receive useful information and advice.¹⁹ Portals can provide infrastructure for the co-production of content and code. Online organisation and communication increase the reach of content. Background information can be provided. The filling of positions is democratic and transparent. Volunteering activity can be demand-orientated, focussing on where it is needed most. Also, pools exist independently from projects and thus relationships to volunteers are more sustainable. In general, collaboration on the implementation of VPFs might lead to an increased awareness about societal problems. The collaboration with administration and the use of joint infrastructure and support services might result in a growing professionalisation and willingness to volunteer. Of course, as with all volunteer activities, the collaborative implementation of VPFs is highly dependent on the offered skillset and diversity of volunteers. Planning might be difficult and accountability is unclear. Also, only digital-savvy citizens will be included in the online pools. If public administration relies more and more on volunteers, it might endanger paid position and face the resistance of commercial brokers and suppliers. Also, citizens might conclude that administration is unwilling or incapable of carrying out the tasks itself.

Collaborative Review

Collaborative review aims at opening review processes for the crowd, not only for selected experts. It can be applied in the patenting process with peer-to-patent, which is already practiced in the USA, Australia, and Japan.²⁰ Crowd reviewers search for conflicts with similar patents and, if applicable, notify the professional reviewer. Also, collaborative review might uncover mistakes in open data and expert review reports. Of course, it might be critical to re-evaluate documents that served as basis for official decision-making. Nonetheless, administration will not be able to avoid this post-hoc review, as has been shown in the case of collaborative plagiarism control.²¹ The crowd's support reduces the workload for full-time employees and speeds up the review process. This eases application pile-ups. External competences are included and might uncover mistakes in reviews. The data

¹⁹ Examples from Germany: <http://ehrenamt-bw.de>, <http://www.wir-tun-was.de>, <http://www.eab-hassloch.de>.

²⁰ Examples: USA (<http://www.peertopatent.org>), Australia (<http://www.peertopatent.org/au>), Japan (http://www.iip.or.jp/e/e_p2pj).

²¹ German examples: Guttenplag (http://de.guttenplag.wikia.com/wiki/GuttenPlag_Wiki), Vroni-Plag (<http://de.vroniplag.wikia.com/wiki/Home>), Schavanplag (<http://schavanplag.wordpress.com>).

quality is improved. Also, the knowledge about state-of-the-art technologies is accessible to a broader public (Osimo 2008, p. 8 ff.; Noveck 2009, p. 47 f.; Klessmann 2009; Graudenz et al. 2010, p. 23 ff.). There is a chance that a broader public will be better informed and knowledgeable. This might strengthen the societal innovation capabilities and foster the economy and sciences. The possibility of external and post-hoc review might also positively influence the ex-ante quality of review reports, as experts will face the scrutiny of their peers and the crowd. Finally, an engaged and informed public that actively reviews data and reports might be a civic counterweight to political authority. It is debateable, however, if amateur reviewers have the necessary skills to accurately evaluate pending patents or expert reports. Also, their engagement is difficult to plan with. Especially for the patenting process, transparency is counter-intuitive and post-hoc revisions create planning insecurities. Reviewers and administrators might object to an increased transparency. Reviewers might fear for their reputation. All in all, expert reviews might lose their authority and thus significance. There is the danger that subjective influences cloud decisions and that jealousy and disfavour occur in the case of innovations. Personal motives might lead to defamations. Data leaks are a significant risk threatening innovations.

Collaborative Monitoring, Problem Reporting, and Open Evaluation

Collaborative monitoring calls for the opening of all data, information, and existing evaluations in order to enable interested citizens to participate. Good examples of open monitoring, which are integrated into administrative processes, are problem-reporting systems²² or augmented maps.²³ Others are platforms to monitor and document political and administrative action in direct communication with the responsible authorities.²⁴ It seems advisable that governments create their own portal to collaborate with citizens in the evaluation of laws and regulations (von Lucke 2009, p. 256 ff.; Walper et al. 2012, p. 520). Collaborative monitoring creates visualised information on decisions and their output, outcome, and impact. The online infrastructure allows near real-time problem identification and information about successes and failure. Therefore, the impact of laws can be assessed and decision-making processes become transparent. The workload can be handled, as the assessment is open for a multitude of reviewers. A thorough foundation for evaluations and revisions is created, which is accessible for government and opposition and thus balances information asymmetries. This offers the opportunity of better decision-making, thorough implementation, and effective policy-making. As a consequence, political steering-capabilities might increase. Additionally, the gathered information allows citizens to counter-weigh political authority. As no evaluation is trivial, crowd evaluators will need guidance by moderators and by a set of specific criteria

²² For example: Germany (<http://www.sags-doch.de>), UK (<http://www.fixmystreet.com>).

²³ For example: The Wheelmap (<http://wheelmap.org>).

²⁴ For example: Abgeordnetenwatch (<http://abgeordnetenwatch.de>).

to produce valid results. Still, their skills to evaluate specific policies and laws are disputable. Their engagement is hardly foreseeable. Additionally, an open communication about mistakes and failures is counter-intuitive to the natural political desire to stay in power. Accordingly, open evaluation might be threatened by missing societal acceptance for mistakes and thus a reluctance of politicians and administrators to subject themselves to collaborative monitoring. The open process might be clouded by subject influences, planned manipulation, or intentional defamations.

Open State Modernisation by Open Innovation

In many applications of open government collaboration, the crowd's potential for innovation has been alluded to. Based on the insights gained through reviews, evaluation, increased transparency, the collaborative knowledge base, and the experience gained from collaborative implementation of public functions, the crowd can make a major contribution to state modernisation. Ideally, external impulses are captured (outside-in) and vice versa (inside-out). These are then coupled into an innovation cycle. There are different strategies for this open state modernisation: It might focus on lead users, specific groups of the population, or be open to the general public. Online platforms might be a suitable infrastructure²⁵, as might be the open-innovation competitions or offline events.²⁶ A toolkit should be developed to compile all possible online and offline tools to undertake open innovation (von Lucke et al. 2012). By opening the process of state modernisation, external impulses and ideas can be captured and the state's capability to solve complex problems increases. Also, because of strengthened citizen participation, the political structures become more democratic. If open innovation is institutionalised, it might increase the political system's resilience and learning capabilities. Acceptance for critical decisions might rise and citizens could be mobilised to engage themselves more. As a result, even more possibilities of collaboration might be developed. Depending on the chosen form of collaboration, the undertaking might be cost, time, and personnel intensive. Also, to manage open innovation and handle the necessary tools, further qualification of administrators and politicians is needed. Additionally, collaboration on state modernisation is limited by the constitutional boundaries. It might be endangered by resistance from the parties and politicians, who fear for their role. This leads to the threat of pseudo-participation without any real effects, which would have negative consequences for the relationship of politicians and citizens. Without the needed sincerity, less engaged groups of the population might be left out and the innovation might be instrumentalised by well-organised lobbies. Institutional learning will not take place and open innovation will not lead to any significant improvements.

²⁵ For example: Atizo (<http://www.atizo.com>), Brainfloor (<http://www.brainfloor.com>).

²⁶ For example: Apps für Deutschland (<http://apps4deutschland.de/>).

5 Conclusion

We have seen many different possible applications of OGC. However, it is not without weaknesses. It is not suitable for all public functions and it introduces a factor of uncertainty into public administration. Participation is difficult to foresee, dependence on the performance and reliability of people increases, quality is more challenging to secure. Still, these are known risks and can be actively planned for. Additionally, the needed openness and culture of sharing is counter-intuitive to many administrative processes. IT security and data protection are an issue. Collaboration is prone to manipulation and is inherently rather focused on the digitally savvy part of the population. Finally, OGC might require a starting investment of money and personnel resources that is perceived as rather high and lead to scepticism. It might face further resistance from politicians, parties, and administrators, as they fear for their role and traditional structures. They might face changes in their procedures and a cultural shift. There is a risk of the implementation of parallel structures and pseudo-collaboration, if the change towards OGC is not undergone wholeheartedly. However, if done right, the investment and effort will prove worthwhile. Administration can make use of mature technology to significantly save costs and reduce its workload. It will receive valuable external impulses and its action will become more demand-oriented. Quality of data, reports, and decisions will improve. This will lead to a more resilient organisation, which can solve complex problems. Administration will be organised better, with clearly defined processes, and more efficient operations. Processes will be transparent and more democratic. Its standing with current and future employees will improve significantly, as it can offer a better work environment. The positive influence will expand to the citizenry. It will be better informed and engaged—a strengthened counter-weight to the state authority, living a sustainable and well-balanced relation to administration and politics.

6 Recommendations for the Implementation of Open Government Collaboration

Firstly, it is essential that a strong guiding vision for open government collaboration is developed and lived by political and administrative leaders. Barack Obama sets a good example with his open government memorandum (Obama 2009). From this vision, goals and strategies for implementation can be deduced and tailored to the respective administrations. This will also help to ensure that collaboration is taken seriously and disappointment is avoided. It is important to formulate realistic expectations: Participation will most probably not be representative, but still very valuable. Also, OGC cannot be managed on top of the daily workload. New positions must be created. Strategies to handle the large amount of new data need to be developed.

Further, a legal framework is needed to incorporate open government collaboration, which lays the groundwork for digitalisation and is in accordance with European Union (EU) data protection and privacy regulations. Guidelines must be developed, to discuss when collaboration is appropriate and which form can be undertaken, how data can be stored and when it must be anonymised.

When it comes to establishing the necessary infrastructure, an overview over the possible products and services will be helpful. Existing guidelines for IT security will be a solid foundation. However, security needs to be balanced with the necessary freedom to act and participate, without which collaboration is impossible. The integration into existing processes and structures is equally important. It should be clearly defined how the collaboration is handled and how results are processed. It is essential to assign responsibilities. Who is in charge of the collaboration? Experience has shown that public relation (PR) is most probably not the preferred option. The respective specialist departments have the advantage of topical knowledge, but a central steering might be more advisable. A new service centre could be established. Maybe, the co-operation with an external service provider is a worthwhile strategy. It could prove helpful to install honorary positions to communicate with volunteers and associations. Also, it must be discussed how to include non-digital-savvy citizens. A vertical multichannel approach seems recommendable.

All changes should be embedded into an open government change management. Structures and culture will change significantly. This should not be underestimated. Neither should the necessary measure for qualification and training of employees. They need to be able to feel comfortable when asking for help and sharing information (Riedl 2012, p. 116 f.; Hansen 2009, p. 43 ff.). They need to learn how to use Web 2.0 technology and all the new tools. It is important to discuss how to interact in these new media. Fears of incessant control, mobbing, excessive transparency, and possibly destructive or manipulative participation should be addressed (Osimo 2008, p. 9). Also, it is important to change the incentives and measurements of success to match the designed strategies and goals.

Additionally, a strategy for communicating and advertising the new collaboration is indispensable. Citizens must be made aware of and motivated to use the possibility to participate. Otherwise, participation will be low and the collaboration will most certainly not deliver the expected results.

These changes, naturally, cannot be undergone without the necessary financing. It is essential, to include OGC in the budgeting. Collaboration could be a criterion for the monetary supports of the projects. However, as resources of administrations are restricted, it is recommendable that a focus is put on collaborative activities that promise financial relief and reduced workload.

Finally, the implementation of OGC should not be hastened. Single projects might be conducted as test runs. Nonetheless, it is important to profit from the experience made by others. Citizens might have set up portals that can serve as examples. Other administrations can share their successes or failures. In the medium term, an institutionalised co-operation in between administration should be set up to facilitate the exchange (NAPA 2009, p. 8). Valuable insights can be gained from joining the OGP.

While these recommendations can be no universal roadmap, they are the starting points for every organisation to develop its own OGC strategy. If they are taken into consideration, administrations will be able to tap the great potential that lies in collaboration.

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The Role of Open Government in Smart Cities

Marc Garriga-Portolà and Júlia López Ventura

A developed country is not a place where the poor have cars, it is where the rich use public transportation.

Gustavo Petro, Mayor of Bogotá.

1 Introduction

The world built in the last decades, lying on the card house of speculative global finance, is decaying and taking with it not only an old economic model but also provoking a deep rethinking of our social, environmental, spatial, and even spiritual environment (Burkhalter and Castells 2009). Moreover, representative democracy, the system upon which many western countries have constructed their welfare states is being fiercely questioned due to multiple cases of corruption, abuse of power, and incorrect spending of public funds. Movements like Occupy Wall Street in the USA or Democracia Real Ya (*Real Democracy Now*, in Spanish) in Spain include in their demands a complete rethinking of the relationship between citizens and their elected representatives, searching for more participative and transparent processes.

In this scenario, nation-states, the old economic centers of power, are losing prominence in favor of new rapidly growing urban agglomerations that share common features at the global level with other similar structures in different countries: these are the so-called global cities (Sassen 2009) that reemerge as strategic places for a wide range of activities and dynamics, critically embracing a new economic role surpassing their national economies.

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ICT, the Revolution

The rapid evolution of information and communication technologies (ICT) has opened up a new world of possibilities for collaboration and, consequently, for urban growth (Yovanof and Hazapis 2009).

On one hand, new technologies have allowed the appearance of new highly collaborative environments that allow the immediate exchange of big amounts of information and facilitate the access and use of this information by its users. Recognizing this, citizens have embraced the use of these spaces and press their direct government representatives to join them in this dialog and use these channels for the sake of a more direct and fluid interaction between citizens and their communities, what is known as Open Government.

On the other hand, the possibilities given by the evolution of the Future Internet technologies, specially the Internet of Things (Schaffers et al. 2011) and the availability of real-time urban information that helps managing the city with some successful pilot projects (Calabrese et al. 2008), are making the futuristic idea of the self-sustainable real-time city a reality. Recognizing this outside academic world, the recent use of new branding names such as Smart Cities has become extremely popular among city managers who are applying these new technologies to their recent urban development plans following a transversal approach that in most cases reaches almost all areas of competence in the city trying to apply a holistic transformational urban plan.

Open-Government Strategies in Smart Cities

In the actual context of a deep economic and social crisis along with drastic budget cuts, global cities face a twofold battle: The urgent need of becoming attractive for investment and the necessity of giving an answer to the increasing openness demands by their citizens.

To resolve the first, many cities nowadays are adopting the smart-city philosophy that claims to be the ultimate solution for achieving a sustainable efficient ICT-enabled city (Giffinger and Gudrun 2011). Therefore, the concept of smart cities seems to be a strategic issue for many cities that see becoming a smart city as a critical device to encompass modern urban development and to highlight the growing importance of ICT in profiling the competitiveness and sustainability of cities (Kommunos 2009). However, despite the urban development debate being taken by the smart city discourse and a wide list of examples of this smart city phenomenon, there is little knowledge of what is hiding behind this urban concept, particularly in terms of what the label ideologically reveals and implies (Hollands 2008).

Regarding the second challenge, nevertheless, the social paradigm of open government in which citizenry and elected public representatives dialog and interact in an innovative and active debate (Ramírez-Alujas and Villoria 2012) to directly create and evaluate public policies has still a long way to go in public managers' agendas (despite few success stories). Axes of open government demands like participation,

collaboration, and transparency (Open Gov Standards 2013) of governmental actions are still widely ignored or underestimated by local authorities. Same as the recognition and willingness of citizens to become implicated in the policies and services that directly affect them, not to say as a powerful tool for the accountability of political actions, and the recognition of the capacity of citizens to become direct actors in the coproduction of public services (Cottica 2012). In this field, many bottom-up actions focused on improving urban life coming directly from active citizens (also known as civic innovators or hacktivists) can be mentioned, like Change by Us or Fix My Street (more examples in subsection “success cases”).

2 The Smart Cities Global Movement

The concept of the smart cities refers to a movement that recently happened at a global level calling for a transversal transformation of all areas of competence of cities, using information technologies as enablers of this change. Indeed, the use of IT for the improvement of urban services is not new and the use, mostly by private sector, of appealing and easy to remember brands to name this transformation have been varying with time (from digital cities to intelligent cities or to cities 2.0, just to name some) to the smart cities tag widely used nowadays by all involved partners: from city managers to private service providers and academia.

The smart city movement calls for a global transformation of all areas of competence of the cities (may that be mobility, environment, economic promotion, social services, culture, health, tourism, education...) searching for the sustainability of services for citizens in an atmosphere of social change and drastic budget reductions. The main objective of smart city approach in cities is, therefore, to apply technological solutions to the already existing processes following a new innovative approach that guarantees, if not improves, their performance and sustainability, often resulting in radically different approaches or even new services. Ultimately, smart cities are focused on improving citizens' welfare as well as fostering economic progress, allowing cities to continue competing at global level for the attraction of investment.

Although recognizing the wide variety of approaches to smart cities taken by cities all over the world, there is a common opinion among researchers that smart city models should be seen as a broad, integrated approach covering the majority of areas in a city. The Center of Regional Science at Vienna University of Technology first proposed in 2007 a model of smart cities based on six axes of performance (Giffinger et al. 2007):

- Smart mobility
- Smart economy
- Smart environment
- Smart living
- Smart people or smart citizens
- Smart government



Fig. 1 Smart city wheel (Cohen 2012)

This model has been used as a basis for many studies and papers, one of them being the smart cities wheel published by researcher Boyd Cohen in the publication Fast Company (Cohen 2012) as represented in Fig. 1.

Nevertheless, the new smart city movement has burst onto the urban management scene with unprecedented strength, appearing in the agenda of urban managers as a key strategic tool for the development of cities. The reasons behind this success may well be explained by the following:

- *Unprecedented demographic shift*: For the first time in human history, in 2007 more than 50% of the world's population lived in cities (United Nations 2004; Alusi et al. 2011). This proportion has gone up and will continue going up as years goes by. Since urban resources availability will remain unaltered and scarce, cities are forced to adopt smart innovative solutions to manage them more efficiently.

- *Environment sustainability*: According to UN Habitat, cities are responsible for the consumption of 75 % of the energy produced in the world and 80 % of greenhouse gas emissions. Therefore, cities have to work on finding smart solutions to guarantee the sustainability of urban green spaces and protect natural resources.
- *New service management responsibilities—from skeletons and skins to electronic nervous systems* (Mitchell and Casalegno 2008): Whereas in the past, cities' responsibilities were focused on managing basic networks (such as sewage or electricity networks), information technologies have brought the need of managing new electronic networks to support communication systems and provide connectivity. This situation is forcing cities to change their work paradigm or, in other words, to evolve from working harder to working smarter.
- *Economic crisis*: Lower budgets in cities and the need to adapt to an atmosphere of restrictions and constant cuts that will remain critical for many years, claim for wise solutions searching for the maintenance and sustainability of a constantly growing number of services.
- *Change of social paradigm*: The rise of social technologies going in parallel with a deep global crisis, not only at economical level but also touching the roots of society values, has encompassed the growing demand of citizens to actively participate in the decisions that affect their life in cities. The maturity of social networks that allow the immediate interaction between users and the evolution of data mining and visualization tools, that provide the availability of information in real-time, are pushing for the empowerment of citizens to take personal responsibility on the creation and design of services and decision-making processes directly affecting them, a process also known as cocreation or co-participation.

The smart cities and their promising associated changes are bringing new opportunities for city managers and citizens that are called to take advantage of this enthusiastic will and vision. First, the movement is an invaluable opportunity to engage with empowered citizens to act on commonly shared urban problems using the advantages that new social technologies bring. Second, active citizens willing to actively participate in city projects could contribute to create urban initiatives based on reusable open standards closer to citizens' needs and therefore ensuring a wider acceptance. Third and finally, the movement can be used to consolidate a change in the model and values of the interactions between citizens and their local authorities, a change based on the common work of public services (Rifkin 2011).

3 Open Government: A Social Paradigm

Improvement of government and public administrations, defined by Pollitt and Bouckaert (2004) as changes to the structures and processes of public sector organizations with the objective of improving their overall performance, has been a topic profusely researched by academia since several decades ago, as it will be quickly reviewed in the first paragraphs of this section.

In mid-1930s, Gulick and Urwick presented the POSDCORB method (which stands for planning, organizing, staffing, directing, coordinating, reporting and budgeting) representing a new approach to the internal organization of governments based on the management theory of Henri Fayol. The main—and “new”—ingredient in the POSDCORB method was the “Human Factor” that happens to be implicit in any organization and what differentiates one organization from another. Motivation, leadership, communication, interpersonal relations were the new contributions of this method. Its main objective was to change the way governments acted to be more efficient based on this human factor implied in any public organization.

The following decades brought several criticism to this model, criticism that culminated in the beginning of the 1990s with the new public management (NPM) paradigm first introduced by Hood (Hood 1991) and then by Osborne and Gaebler (Osborne and Gaebler 1992). The main goal was the same: to improve government action; in this case using the influence of the strong entrepreneurial spirit accompanied with required political support. It coincided with Al Gore (then VP of Clinton’s Administration) (1993) that proclaimed the need for “a government that works better and costs less.” Its main attributes went from talking about citizens to talking about customers and outsourcing of public services. In addition, market mechanisms were introduced in the management of public services and instruments to control expenditure were strengthened, among other measures to simplify (reduce) the administration.

As noted by Ortiz (2008) a couple of decades after the appearance of NPM we were talking about the same or similar things. Ramirez-Alujas (2011) also criticizes NPM “...has left a trail of models, differing experiences and evaluations as applicable noticeable signs of exhaustion and facing new realities that press for the recovery of the audience beyond efficientist instrumental logic...” (free translation).

In addition, in the beginning of 2011, the World Economic Forum published the paper “The Future of Government: Lessons Learned from around the World” (WEM 2011). The main conclusion of this document was the need to transform governments into organizations following what they call FAST (which stands for flatter, agile, streamlined, and tech-enabled) approach. Some of the ideas provided by this paper were the need to decrease the distance between government and citizen using information technologies such as social networks or mobile devices. This technology could also be used to provide and exchange useful information to citizens in the deliberations and decision-making processes. Another idea was to facilitate decision making. Using information technologies greatly facilitate decision making with citizenship and/or internally in government. In addition, thanks to technology, data needed to inform decision-makers can be opened and offered for its reuse, a movement known as open data. Finally, another idea was to collaborate within and between governments and citizens in order to encourage the exchange of ideas, solutions, and provide economies of scale.

In short, according to this World Economic Forum’s paper, twenty-first century governments must become work-based FAST organizations in a network of planar,

agile, and flexible structures, with a high use of technology and open to the entire society.

Therefore, without losing all the accumulated knowledge of decades and decades of “improvement” in public administration, it is necessary to formulate a new paradigm that takes into account the traditional bureaucratic sediment, based on fairness and enforcement, and the concern for efficiency and economy advocated by the NPM and the need to go a step further to take into account the needs, values, models specific to the Network Society (Castells 2000), a concept that gathers all the changes occurring at political, cultural, economical, and social level thanks to the spread of information and communication technologies. Therefore, in this new paradigm we must add these “new values” that ultimately talk about transparency, participation, accountability, public innovation, conversation, hacker ethic (Himanen 2002), etc.

Is, thus, Open Government this new paradigm?

Although there is an Open Government Partnership (and its declaration), currently there is still no clear consensus on which is the exact definition of open government (even though there are initiatives such as open government standards).

A proposed definition of Open Government by Garriga (2012) is that open government is the paradigm in which government and public (and the rest of society) are at the same level, they interact face to face, as opposed to “traditional” government where the government is “above” citizenship, deciding upon the policies and services to be performed without consulting (beyond holding elections every 4–5 years).

This definition is, however, more graphical than operational. Another more appropriate definition is that of Ramírez-Alujas (Garriga 2012) is manifested in these principles:

- a. “improve levels of transparency and access to information by opening public data (to exercise social control and accountability), and reuse of public sector information (to promote innovation and economic development);
- b. facilitate participation of citizens in the design and implementation of public policies (and influence decision-making);
- c. encourage the creation of opportunities for collaboration between the various stakeholders, particularly among government, civil society and the private sector to co-design and/ or co-produce public value.”

Under this new paradigm lies the central idea of involving citizens (and the rest of society) in public actions, making these not anymore an exclusivity of public administrations. Embracing the concept of open government we are trying to make government work better with the involvement of the whole society and reducing the budgets.

Therefore, the answer of the previous question is yes, Open Government is the new paradigm to rule our governments in the Network Society.

4 Open Smart Cities: The City of the Future Needs Open Governments

Smart Citizens for Open Governments

According to the popular 6-axes definition of smart cities provided by the Vienna University of Technology, smart citizens and smart government are two of the axes upon which effort should be put in order to achieve a complete development of smart cities. These two axes represent two clear links between the two concepts discussed in this chapter: smart cities and open government.

Firstly, as seen in the previous sections, open governments must necessarily count the deep implication of highly motivated and participative citizens that are knocking on the doors of their closest elected officials. Those are the smart citizens, citizens asking for their space in decision-making processes in the city and are equipped and well-prepared to use social technologies to directly connect in real-time with each other and take the pulse of the city.

In addition, smart citizens will be those who are ready to take an active part in the life of the city and are aging to learn more about not only what is being done with public resources but also to take active part and monitor their expenditure. Smart citizens are empowered by a massive use of social information technologies, and will demand for transparency and real-time communication with their city officials and their environment, and are keen on using these tools to improve their quality of life. Furthermore, smart citizens will ask for the publication of public data in open formats that they can reuse to track progress of their city performance (open data). These are the open smart citizens.

Secondly, smart governments will be those that clearly visualize and understand the new paradigm change when talking about the communication between citizens and their city managers; being more direct, without any submission. Smart governments will also be those that understand that information technologies can be of great use to work towards the sustainability and efficiency of public services and the economic progress of cities. Moreover, smart governments will have to be prepared to attend the needs of a new type of active citizen, thirsty of information who claims for a more direct and real contact with its urban space and those who manage it and who will ask for real-time data, to monitor and evaluate the performance of the city in open standards. Smart governments will be and must be open, only in this way they can make easier the data and services interoperability among other governments and, in fact, among anything (Jiménez 2013). Smart governments will be open to increase the return of investment, the efficiency, of governments (Howard 2013). These smart governments are, in fact, open governments.

Hence, if we want to achieve a real smart city we need smart citizens and open governments, it is unattainable without them.

Success Cases

The following cases are examples of initiatives that, in any sense, are involved in smart cities and open government concepts. In each case there is a brief description and the reason that justifies why it is listed here:

Adopt-a-Hydrant <http://adoptahydrant.org/>

Adopt-a-Hydrant is an initiative of the city of Boston to encourage residents to shovel out snowed-in fire hydrants. Its website allows citizens to “adopt” a fire hydrant, or state that you intend to help shovel that fire hydrant out if it gets covered by snow.

The idea is simple (but powerful): Every year it snows a lot in Boston producing several problems. One of them is that specific emergency tools are inoperative because they have been buried by the snow. The city council had to spend a lot of money to maintain these hydrants in proper conditions, but with this citizen engagement tool the budget of this maintenance has dropped dramatically. Every “adopter” must keep its hydrant in good conditions, without snow, and if a problem is detected, it must be directly reported to the council.

This is another example of a public service whose delivery is based on cooperation between the city council and citizenship with the help of technology.

Awi.net <http://www.smartcityviladecans.com>

Awi.net is an interesting smart city project that provides several services to its citizens in Viladecans, a large town (60,000 inhabitants) close to Barcelona, Spain.

In this case, young people help elderly people in order to reduce the digital gap. Awi.net is a project promoted by the city council, where the main role is played by youngsters, for the first time in their lives, who become teachers to older generations not so used to manage new technologies as them.

This is a good example of a tech-enabled civic engagement initiative that is co-created by both the local government and their citizens giving solution to a public interest service: improvement of digital education.

iCity Project <http://icityproject.eu/>

As we mentioned before, nowadays governments need to do more with less. In this sense, governments are focused on providing public services (services that governments are obliged to deliver because they are entitled to by law). However, there are other kinds of services of public interest but the governments are not legally forced to deliver. In an environment of shrinking budgets, governments tend to set these types of services apart.

iCity is a European smart city co-funded project aimed at solving this problem. Its main goal is to empower third parties (private companies, NGOs, neighborhood associations, etc) to deliver services of public interest, following a co-creation approach. To do so, the project will open or grant access to public IT infrastructures at street level in the four participating cities: Barcelona, London, Genoa, and Bologna (and provide an iCity platform to help these third parties in order to develop



Fig. 2 Snapshot of smart citizens platform

services). Examples of these opened infrastructures could be WiFi Network, Park Register Platform, Complaints Platform, Sensors Platform, etc.

In this project the involved governments in this project (the councils of the four cities mentioned before) have opened their IT infrastructures in order to provide more public interested services made by citizens themselves, therefore, this case is a mix of openness, technology, economic boost, and co-creation.

Lisbon's participated budget <http://www.lisboaparticipa.pt/>

Lisboa Participa is a platform that gathers all municipal participation initiatives of the city of Lisbon. One of the most prominent crowd-sourcing initiatives is the participated budget through which any citizen can submit online proposals for projects in the city. The proposed projects are voted online by other citizens and the most voted cases are finally included in the municipal annual budget.

This is a good example of citizen's engaging in the decision-making processes traditionally reserved for elected officials only with the help of technology.

Smart Citizen <http://smartzitizen.me>

Smart citizen is a crowd-funded project started in Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia that consists on the manufacturing of Arduino-based boards equipped with environmental sensors and connectivity that are placed in citizens' homes. These boards send the real-time information on variables such as humidity, noise, temperature, or pollution to a platform that gathers and visualizes these data through its own website (Fig. 2). Ultimately, its objective is to serve as a node for building productive and open indicators, and distributed tools, and thereafter the collective construction of the city for its own inhabitants.

Smart citizen is a good example of how citizens can directly participate in the creation of a new service from scratch that directly connects people with their environment and city to create more effective and optimized relationships between resources, technology, communities, services, and events in the urban environment.

At the time of writing this chapter, some local governments have expressed their interest in the project to combine the smart citizen data with official public data. Thus, this is another co-creation case made by citizens that are engaged in public affairs (with the help of the technology) and governments with an open vision.

5 Conclusion

Throughout this chapter, we have seen how different tendencies like the open government and the smart city movement, at first sight not sharing a clear connection, have a strong link when it comes to citizens' empowerment and implication in urban management decisions and delivery of the services of public interest.

In the first sections, we have seen how smart city approach is based on a transversal transformational approach that uses technology as an enabler of change. However, the role of IT-empowered citizens in the construction of the smart citizens should not be minimized. The deep economic and social crisis in which we are sinking has brought a new model of smart citizen that claims for transparency and decision capability in the urban space management. Smart citizens happen also to be well equipped with IT tools and savvy in using them to track, collect, visualize, and share urban data in real time, therefore asking for the availability of this public data in open standardized and reusable formats.

Open governments are the solution for local governments to give an accurate and proactive answer to the smart citizens and their demands.

The last section contains some good examples of open-government solutions used in cities that are including their solutions in their smart city approaches. There are, of course, many others that due to space restrictions could not be commented in this chapter.

For all the above, smart city strategies being currently developed in cities are called to introduce open-government elements in their approaches. There will be no smart cities without smart citizens and there will be no smart cities without open, transparent, and collaborative governments.

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